RAILROAD GAZETTE

FRIDAY, MAY 27, 1898.

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Pintsch Gas Lighting on Railroads.—A Correction.

In last week's issue, page 363, was given a table showing the increase in the use of Pintsch gas for lighting railroad cars and locomotives in different countries for the year 1897. The increase in the United States for last year should have been 1,190, instead of 190, as given.

Contributions.

Railroad Relief Departments.

To the Editor of the Railroad Gazette.

"Be as mindful of the interests of your employees as you expect them to be of the interests of the company," was the keynote of a report presented at the Niagara Falls meeting of the American Society of Railway Superintendents, September, 1896, by the committee on the relations between the railroad companies and their employees. The committee also urged the formation of relief departments under the control of the companies as the best means of linking officers and men of all grades in common interest.

The need of such associations on large railroads is a natural result of the consolidation and growth of minor companies into extensive systems. The element of personal acquaintance and friendship still existing on small roads between employees of all ranks, from manager down to section hand, becomes unwieldy and impossible on systems where a division superintendent has charge of thousands of men and where employees frequently are transferred from one end of the line to the other.

In Bulletin No. 8 of the Department of Labor at Washington Professor Johnson clearly pointed out the value of the relief department to the railroads as well as to the public at large. Yet many railroad companies hesitate to propose the establishment of such an organization to their men, feeling that there is opposition to the movement and dreading the consequences of a failure. This opposition is partly due to the predominance of brotherhoods and labor federations among the employees and the strong resistance of the leaders of such bodies against all attempts to lessen their power and prestige.

But there are also other reasons why the relief departments in their present form are not as popular as they should be. This subject was given some attention in the tenth annual report of the Interstate Commerce Commission, and several of the objectionable freatures of the relief departments were reviewed. The principal objections were set forth as follows: Making membership a condition of employment; waiving the right to damages for injury by accident in service; forfeiting membership when leaving the service; creating a sense of dependence on the continued good-will of officials and the assumption of powers by corporations, contrary to American ideas of independence.

These objections also found expression in the arbitration bill which has just been passed by Congress, and State Legislatures have from time to time stepped in with remedies. The courts have also had a hand in correcting some of the grievances.

But the future of the relief departments lies undoubtedly within themselves; in the power of their governing boards to legislate until the objectionable features have been eradicated, and they have become as popular as they deserve to be. If they are made to work for the true benefit of the employee the good of the corporation will be best served.

Considering, now, the objectionable features of these departments from the employees' side, there is, first, the compulsory membership. As far as the voluntary relief departments are concerned, this objection does not hold good. No conditions of that nature are openly made in hiring new men, and no pressure is brought to bear on those already in the service. It is true that during the recent period of depression, when reduction in the working force was the order of the day, jealous foremen and petty officials sometimes retained men belonging to the relief department in preference to others, regardless of ability or seniority. As a consideration for those who had paid their money into the fund this was excusable, but it was unjust to the others, and is contrary to the true spirit of voluntary membership. To the credit of the railroad companies, it can be truly said that membership is not intended to have any influence whatever on the standing of an employee.

As before mentioned, State Legislatures have also taken this point under consideration. Ohio, for instance, passed an act in 1890 making it unlawful for any corporation to compel or require an employee to join any asssociation or to withhold any part of an employee's wages for the payment of dues or assessments in any organization as a condition precedent to securing employment. The same act also restrains the company from discharging an employee because of his refusal or neglect to become a member. Attempts to bring action on such ground have so far failed, however, on account of too indefinite charges.

Relief departments with compulsory membership are apparently less concerned by such legislation, though primarily aimed at them, for where every employee is a member there can be no discrimination on account of non-membership, and if a new man's application for work is not acted upon when unaccompanied by an application for membership, he could not very well have redress in court to force his services on the company.

The next objection, from the employees' point of view, is the waiving of right to damages for injury or death from accident in service. There is an impression prevalent that membership means a quit claim to all damages to which an employee or his heirs might be entitled. But the regulations of the department are no bar to actions in court. On the contrary, they provide only that if a member chooses to accept the benefits of the relief department in preference to bringing action, such acceptance shall operate as a release of all claims against the company in that particular case. When an employee's injuries or death are clearly caused by negligence of the company's officers or agents he (or his heirs) can press his claim in court regardless of membership, and almost any jury will, out of sympathy with the victim and prejudice against the corporation, award him liberal damages.

Ever since the Supreme Court of Georgia rendered its celebrated decision against the so-called "death warrants" (Cook vs. Western & Atlantic, 1883), it has generally been held that any contract or agreement intended to release an employer from liability for negligence causing injury or death to an employee is void. Moreover, if a member of the relief department is not satisfied with the decision of the superintendent of the department, he may, in accordance with the regulations, appeal to the advisory board, and if his claim is still rejected the courts have held that he is entitled to maintain action in court, precisely the same as if he was not a member of the department, the rules of the same to the contrary notwithstanding (B. & O., 46, N. E. Report, 577). This decision laid down the ruling that parties cannot by contract take away the jurisdiction of the courts, and that instruments with that intent are void.

Another decision bearing directly on this point was handed down recently by the Supreme Court of Indiana (Montgomery vs. P., C., C. & St. L.). This rules that an employee cannot waive his title to damages for injuries by signing an agreement before the injury is incurred. This may be construed so that if an injured member accepts the benefits to which he is entitled, the fact of his doing so does not release the company of claims for damages for said injury.

The third cause for employees' dissatisfaction is the regulation which makes the money a member has paid into the fund of the department a total loss to him if he leaves the service. This objection does not hold good with all relief departments. As early as 1883, the Baltimore & Ohio Relief Association introduced amendments to its rules allowing members, on retiring from the service, to retain their interest in the death benefit feature. This rule still holds.

This provision covers all that an employee can fairly demand under the circumstances. As far as relief during sickness or disablement is concerned, the member gets in return for his dues the assurance of support. It is this assurance that he pays for, and as long as he is in the service he gets his money's worth as he needs it. When he leaves the service the company has no means to make him conform to the rules under which the relief is granted. Not so with the death benefits, however. In life insurance the event which makes the sum payable is certain to occur, and the time of happening is the only contingent element.

The company has neither moral nor legal right to deprive a man's heirs of this benefit, and the act of doing so may work great injustice on them. Take, for illustration, a laborer whose wages are not more than sufficient for the support of himself and family. He cannot afford to keep up his dues in more than one insurance organization, and as a loyal employee he enters the relief department of the company, hoping thus to secure his family from immediate want at the event of his death. At 46 years of age he is dismissed at a general reduction and forfeits his membership. He may enter the employ of another company, or he may after a time be taken back by the same company, but he cannot again come into the relief department, nor can he obtain other life insurance except at rates largely in excess over what he paid when he first commenced to contribute. If his wages are not commensurately increased, he will be at an economic disadvantage all the rest of his life.

The alleged right to place a man in this position is based on the fact that he voluntarily signs an application for membership, agreeing to be bound by the regulations. This application purports to be a contract between himself and the company, but, contrary to the spirit of law, it is enforceable only at the option of one of the parties thereto. A dismissed employee may be willing to fill his part of the contract by offering his dues, but he can not make the company, the contract could undoubtedly be set aside agreement.

Furthermore, the death benefit, which is one of the purposes of the trust created by the contract, constitutes the "quid pro quo," which makes that part of the contract valid. There is no other consideration for the money paid in for that purpose, and if the withdrawal of this benefit is in the power of the company the contract could undoubtedly be set aside on the ground of inadequacy of consideration.

The question may be asked: Why do not dismissed members seek redress in court? The answer is that members are seldom dismissed without good cause, which it is to their advantage not to ventilate in court. They will sacrifice what right they possess rather than secure it by running some risk of sacrificing their reputations. When reductions in force have been necessary, the roads have had enough bad material among the non-members without thinning out the ranks of the relief department. As for the roads with compulsory membership, they have, as before stated, made provisions to meet the objectionable point. The employees' unions, the brotherhoods and the life insurance companies, although antagonistic to the relief departments, will not take issue with the railroads on this point because it is their strongest argument aganst the relief departments as compared with other insurance, and as long as this objectionable feature is retained the relief department is not so dangerous a competitor.

Another point in the regulations which has elicited unfavorable comment among employees is the vagueness of the pension feature. Except on the Baltimore & Ohio this feature exists only in the book of rules, in which reference is made to a fund for the purpose of pensioning superannuated employees. Some of the relief departments now have a surplus, yet no steps have been taken to carry out the provision. The word "fund" does not imply that the sum must be allowed to accumulate until the interest will fulfill the purpose of the fund. The word simply means a quasi-permanent obligation for the payment of definite amounts as they become due and for which fixed provisions have been made. These obligations become due as each member reaches the age of superannuation, and to deny the present old men their share of the fund is to favor the younger members by retaining the sum for their future use when they have grown old.

To the credit of the railroad companies it should be said that it is the practice with them, as with many private employers, to keep their faithful men on the rolls in their old age by giving them lighter duties at less wages, on the principle that work of any kind is better than no work. These men, however, are really superannuated; that is, disqualified by age for the kind of work they have been doing, and if there is a fund available for their support they are entitled to share in it if they prefer a pension to accepting duties of another and often uncongenial nature.

A great deal more could be said about the defects of the relief department, but the above will suffice to show that some of the regulations most vital to the organization are inadequate and cannot be legally enforced. Railroad officials may contend that they are satisfied with the results and that changes are not needed, but every defeat in court lessens the confidence in the organization. They may point to the increasing membership, yet on all the roads with voluntary relief departments not more than one-half of the aggregate number of employees are members. Of these a large percentage have come in under misapprehension or under subtle pressure, and they retain their membership only for the sake of the money already paid in or from a sense of fear. There is among any large body of workingmen a certain percentage who, by reason of physical disqualification, will not be accepted by the regular life insurance companies, and these can always be counted on from the outset for a new relief department, while the restrictions are suspended. Augmented by those who join from fear of losing their jobs, these form

the nucleus of the department. Those that join for the good of the cause are few and are principally officers and salaried men. The growth of the membership depends upon the care in selection of new men not already affiliated with other beneficial organizations and upon the stability of such assessment associations that may be in existence among the employees at the time.

The railroads have now entered upon a new era of prosperity. Why not tie the new men, who are put on as the work increases, closer to the common interest by offering them all that they can get elsewhere in the way of relief or insurance, without asking them to give up any of their personal privileges? A few years of prosperity will be followed by the periodical hard times; how much better for all if at the next turn employer and employee stand side by side instead of facing each other. Could not then the managers unbend a little and give the men more of the paternal relationship of which the relief department is capable?

There is on the Metropolitan Street Railway lines of New York City an organization among the officers and men similar to the relief department, but of a broader scope. It aims to better the physical condition of the members by recreation and other means, gives free medical attendance during sickness, and on the principle that prevention is cheaper than cure the association's physicians can be consulted by members free of charge at their offices and also at stated hours at other points convenient for the men.

The question may be asked: Why have not the railroad employees brought up the matter through their representatives on the governing board? Because their delegates are as a rule mere functionaries, who do not care to incur the displeasure of the company's representatives by offering amendments which may not be in accord with the company's policy. The impulse must come from the company, through its own officers on the board, pursuant to the recommendations quoted at the beginning of this letter: "Be as mindful of the interests of your employees as you wish them to be of the interests of the company." * * *

United States Railroad Statistics for 1897.

The Interstate Commerce Commission has issued its preliminary report on the income and expenditures of the railroads of the United States for the fiscal year ending June 30, 1897. The report is signed by W. E. Burleigh, Assistant Statistician. The similar report for the year ending June 30, 1896, was noticed in the Railroad Gazette of Jan. 29, 1897, and the totals from the final report for that year were published in the Railroad Gazette of Dec. 31, 1897. The present report repeats the complaint that the railroads do not send in their statistics with the necessary promptness. Only about 25 per cent. of the companies file their reports within the time limited by the Commission. The present report includes the returns of operating lines which filed their annual reports before Dec. 1, 1897, and this pamphlet is dated Dec. 16, 1897, though it appears to have just issued from the Government Printing Office. The mileage reported on is 7,659 miles greater than that on which the last preceding preliminary report was based.

The principal totals are as follows:

Number of companies reporting	743
Mileage of road reporting	180,028
Earnings, passenger	$314,859,616
" freight	773,598,253
" miscellaneous	28,155,485
" total	1,116,613,254
Operating expenses	747,562,398
Net earnings (a)	369,050,856
Other income (b)	34,166,656
Net income (a + b)	403,217,512
Fixed charges, rentals, etc., and taxes	347,339,332
Dividends paid	57,290,579
Deficit from operatons of the year	1,412,399

The report states that the item showing the amount of dividends does not include those declared by leased or subsidiary operated lines from rentals paid to them by operating companies. If these dividends were included, the total would be increased from 57 millions to about 87 millions. The total amount of taxes paid, included in the eleventh item in the foregoing table, was $40,979,933. The aggregate amount of taxes reported in the last preceding year was $39,970,791, which amount included taxes paid by subsidiary lines. The final deficit shown in the present report, $1,412,399, is to be compared with a surplus in the last preceding year of $6,328,667, and with a deficit in 1895 of $31,075,030.

The average gross earnings per mile of road for three years and the percentage of expenses to earnings have been as follows:

	1897.	1896.	1895.
Miles reported on	180,028	181,983	177,746
Earnings per mile of road	$6,202	$6,320	$6,050
Percentage of exp'ses to earnings	66.95	67.20	67.48

An Australian Rail Contract.

The Melbourne correspondent of the Economist (London) writes as follows under date of March 22:

The Victorian Railway Department has for some time desired to place a contract for heavy steel rails to replace light and worn rails, and tenders were opened on the 24th ult., and on the 4th inst. the successful tender was announced. The specification was for rails and fish-plates as follows: Rails, 7,000 tons, of 80 lbs.; 240 tons, 95 lbs.; 5,240 tons, 110 lbs.; 300 tons, 115 lbs.; fish-plates, 700 tons, 80 lbs. (in two forms); 550 tons, 100 lbs. (in two forms). The Victorian fish-plates require special adaptation of machinery in their manufacture. The Department is noted for the exacting nature of its inspection, occasionally, it is thought, carrying its tests to an unnecessary theoretic extreme. Hence, certain manufacturers are not enamored of the fish-plate section of Victorian railway specifications. Deliveries under the new contract are fixed as follows: 25 per cent. of the whole within six months, 25 per cent. within nine months, and 50 per cent. within twelve months.

Five tenders were received, two being English, two American and one German. All the tenders but one were on usual c. f. i. terms, inclusive of agents' commission. Under the general conditions of Victorian contracts 2½ per cent. has to be added as a provision against certain contingencies (such provision in a steel rail contract being practically nominal), but this provision ought to be ignored in this statement. Two of the tenders received were imperfect, and were accordingly rejected. That of Messrs. Krupp & Co. stipulated delivery f. o. b. Antwerp instead of c. f. i. Melbourne. It amounted to £65,932, being £56,610 for the rails and £9,322 for the fish-plates. The Carnegie Company tendered for the railway only, at £5 1s. 9d. per ton, c. f. i. Melbourne. Three valid tenders remained as follows:

Pennsylvania and Maryland Co.	£73,630
C. Cammell and Co., Limited	77,894
Messrs. Bay and Co., Limited	79,274

The Pennsylvania & Maryland Company's tender has been accepted. The average price for the rails alone works out at £4 19s. 9d. per ton, c. f. i. Melbourne.

The question may be put whether the lowest possible rate of freight was quoted to the English manufacturers by the Australian shipping ring in London, whether, in fact, the ring does its best to help large special freight transactions. It is believed that Messrs. Krupp & Co. were indifferent about securing the contract, and the amount of their tender (say an average of £4 8s. 7d. per ton for the rails f. o. b. Antwerp) appears to be rather high relatively. However, the fact remains that a considerable contract has been taken by an American company in competition with two English companies. The Australian public are surprised at the result.

Train Accidents in the United States in April.

COLLISIONS.

Rear.

7th, on Pittsburgh, Cincinnati, Chicago & St. Louis, near Fernwood, O., passenger train No. 2, which had been unexpectedly stopped, was run into at the rear by a following freight train, badly damaging several cars of the passenger train and the engine and 8 cars of the freight. The conductor of the passenger train and 4 passengers were injured.

15th, on Lake Erie & Western, near Albany, Ind., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking several cars. A tramp was injured.

21st, on New York Central & Hudson River, at Fairport, N. Y., a freight train, which was taking water at the station, was run into at the rear by a following freight, wrecking the engine, caboose and several freight cars. The wreck took fire and 4 cars were burned up. One trainman was killed and 2 were injured. The engineman of the second train had fallen asleep.

28th, on Louisville & Nashville, near Culleoka, Tenn., a freight train descending a grade broke in two, and the rear portion afterward ran into the forward one, wrecking 10 cars. A brakeman was injured.

30th, 8 p. m., on Pittsburgh, Cincinnati, Chicago & St. Louis, at Newark, O., a freight train descending a grade broke in two, and the rear portion afterward ran into the forward one, wrecking 7 cars. The conductor was injured.

And 12 others on 9 roads, involving 1 passenger train and 16 freight and other trains.

Butting.

1st, on Pennsylvania road, at St. Nicholas, Pa., butting collision between a freight train and an empty engine, badly damaging both engines. The empty engine, having been reversed and deserted, ran back up grade about two miles to Frackville and collided with some freight cars, several of which fell down a bank.

13th, on St. Louis & San Francisco, near Coffeyton, Mo., butting collision of freight trains, wrecking both engines and 12 loaded cars. One engineman, 1 fireman and 1 brakeman were killed. It is said that the eastbound train ran past a station at which it had been ordered to wait for the westbound.

13th, 9 p. m., on Chicago & Alton, at Edwardsville Crossing, Ill., butting collision between a passenger train and a freight, both running at good speed. Both engines were wrecked and one fireman was fatally injured. It is said that the freight encroached on the time of the passenger, the freight engineman's watch having stopped.

14th, on Cleveland, Cincinnati, Chicago & St. Louis, near Springfield, O., butting collision between a westbound passenger and eastbound freight train, badly damaging both engines. The passenger conductor and several passengers were injured.

16th, on Chicago, Rock Island & Pacific, near Libertyville, Ia., butting collision of freight trains, making a bad wreck. One engineman, 1 fireman and 1 brakeman were killed. The conductor and engineman of the eastbound train forgot a meeting order which had been given to them. One of the trains nearly stopped before the collision, having been flagged by a farmer.

23d, 11 p. m., on Southern Pacific, at Aden, N. M., butting collision between a westbound freight train and an eastbound train carrying soldiers, badly damaging both engines and several platform cars in the military train. One man was killed. It is said that the eastbound train passed a meeting point ahead of time.

26th, 2 a. m., on Cleveland, Akron & Columbus, at Millersburg, O., a northbound freight train standing at the station was run into by a southbound freight train running at full speed. Both engines and several cars were wrecked and one engineman was injured.

26th, on Chicago & Northwestern, near Fond du Lac, Wis., butting collision between a passenger train and a freight, the latter drawn by 2 engines. The second freight engine fell off a bridge into the Fond du Lac River. One engineman was killed and another seriously injured. It is said that the freight was running contrary to an order directing it to take the side track at Princeton.

And 5 others on 5 roads, involving one passenger train and 9 freight and other trains.

Crossing and Miscellaneous.

9th, on Chicago & Erie, at Lima, O., a passenger train ran past a red flag at the station and into the head of a freight train standing on a side track. A fireman was killed and 1 engineman and 2 passengers were injured. The collision was due to the inability of the engineman to control his speed. It is believed that the air in the reservoir had been exhausted and that the air pump had stopped, in consequence of becoming heated, unnoticed by the engineman.

13th, 9 p. m., on Delaware & Hudson, at Green Island, N. Y., collision between a passenger train of the Delaware & Hudson and one of the New York Central. Three passengers were injured.

19th, at Central City, W. Va., a freight train of the Chesapeake & Ohio ran into a passenger train of the Ohio River road, overturning 1 passenger car. Two employees were injured.

23d, on Kansas City, St. Joseph & Council Bluffs, at St. Joseph, Mo., collision between a freight train of the Burlington road and a switching freight of the Chicago Great Western, due to a misplaced switch. One engine and 5 cars were wrecked and 1 fireman was injured.

28th, on Cleveland, Cincinnati, Chicago & St. Louis, at Anderson, Ind., collision between a passenger train and a freight, badly damaging 1 engine and several cars. Four passengers were injured.

29th, on Philadelphia & Reading, at Frackville, Pa., collision between freight engines, badly damaging both. One of the enginemen was fatally scalded.

And 14 others on 10 roads, involving 3 passenger and 20 freight and other trains.

DERAILMENTS.

Defects of Roadway.

7th, on Great Northern, near Marias, Mont., 12 cars of a freight train broke through a bridge which had been weakened by a flood. The wreck was immediately blown to pieces by an explosion of dynamite in one of the cars, and the portion above water took fire and was burned up. The engineman, fireman and 1 brakeman were killed and the conductor and a drover were injured.

12th, 10.30 a. m., on Southern Pacific, near Sacramento, Cal., a passenger train running at high speed was derailed on a trestle 25 ft. high, and 1 car almost fell off. No person was injured. It is said that the track had been distorted by solar heat.

15th, on St. Louis, Iron Mountain & Southern, at Carondelet, Mo., a passenger train was derailed by a broken rail and the first 3 cars were ditched. Three trainmen were injured.

16th, on Pennsylvania road, near Bolivar, Pa., a freight train was derailed by a broken rail and the caboose was overturned. The conductor was badly injured.

And 4 others on 4 roads, involving 4 freight trains.

Defects of Equipment.

5th, on New England road, near Hopewell Junction, N. Y., a freight train was derailed by a drawbar which was pulled out and fell upon the track, and several cars were thrown crosswise of the track just at the entrance of a through Howe truss bridge 112 ft. long. About a dozen cars, most of them empty, fell, with the bridge, to the stream below.

23d, on Lake Shore & Michigan Southern, at Leon, O., a freight train with a helping engine at the rear broke in two on an ascending grade; the cars were stopped so quickly by the automatic application of the air brakes that the pushing engine crushed the caboose, completely wrecking it. The conductor, sitting in the cupola, was injured.

And 12 others on 12 roads, involving 12 freight trains.

Negligence in Operating.

None reported involving injury to persons. Of others there were 7, on 7 roads, involving 1 passenger train and 6 freight trains.

Unforeseen Obstructions.

None reported involving injury to persons. Of others there were 3, on 3 roads, involving 1 passenger train and 2 freight trains.

Unexplained.

2d, on Canadian Pacific, at Danforth, Me., a passenger train ran off the track and 1 passenger car fell down a bank. Two passengers were injured.

6th, on New York, New Haven & Hartford, near Thomaston, Conn., a car in a work train was derailed near a bridge, and the body of the car knocked out three panels of the bridge, which was a Howe truss. Two laborers riding on a car of sleepers were killed and 1 was fatally injured.

7th, on Chicago & Alton, at Lawndale, Ill., a freight train was derailed and 11 cars of oil were wrecked. Two tramps were injured and nearly drowned in oil.

10th, on Boston & Albany, near North Brookfield, Mass., a passenger train was derailed and the engine fell into the ditch. The engineman was injured.

14th, on International & Great Northern, near Easterly, Tex., a freight train was derailed and 11 cars were ditched. A tramp was injured.

27th, on Wabash road, near Effingham, Ill., a freight car in a special passenger train carrying soldiers was derailed, and, with 3 passenger cars, was overturned in the ditch. One passenger was injured.

30th, 2 a. m., on Southern Pacific, near Ravenna, Cal., a freight train drawn by two engines was derailed, and both engines and 8 cars were overturned. Three trainmen were injured.

And 29 others on 26 roads, involving 3 passenger and 26 freight and other trains.

OTHER ACCIDENTS.

15th, on Cincinnati, Portsmouth & Virginia, near White Oak, O., a baggage car in a passenger train was badly damaged, inside, by fire which was caused by an overheated stove. The baggageman was asleep when the fire started and was severely burned in putting it out.

And 6 others on 6 roads, involving 5 passenger trains and 1 freight.

A summary will be found in another column.

The Federal Arbitration Law.

The arbitration bill of Senator Kyle (S. 3,662) has been passed by both Houses of Congress and is now before the President. The main features of the bill were briefly noted in the Railroad Gazette of May 13.

Sections 1 and 2 provide that whenever a controversy concerning wages, hours of labor or conditions of employment arises between a railroad engaged in interstate commerce, and its employees in train operation, seriously interrupting or threatening to interrupt business, the Chairman of the Interstate Commission and the Commissioner of Labor shall, upon the request of either party to the controversy, put themselves in communication with the parties interested, and shall use their best efforts by mediation and conciliation to settle the dispute amicably; and if these efforts prove unsuccessful, they shall at once endeavor to bring about an arbitration of the controversy. (The clause requiring wages to be reasonable and just has been stricken out.).

Section 3 provides that a controversy which cannot be settled by mediation may be submitted to three arbitrators, chosen, one by the employer, one by the labor organization to which the employees belong, and a third by these two. If a majority of the employees are not members of a labor organization they may, by majority vote, appoint a committee of their own number to select their arbitrator. If the third arbitrator is not named within five days, the Interstate Commerce Commissioner and the Labor Commissioner shall name him.

The submission shall be in writing, signed by the parties, and shall contain appropriate provisions by which the respective parties shall stipulate (1) that the Board shall meet and act within certain limited times and that pending arbitration the existing status shall not be changed, but no employee shall be compelled to render personal service without his consent; (2), that the award shall be filed in the United States Circuit Court and shall be final and conclusive upon both parties, unless set aside for error of law apparent on the record; (3), that the parties will execute the award and that it may be enforced by a Court of Equity, provided that no injunction shall compel a laborer to work against his will; (4), that dissatisfied employees shall not quit under three months without giving 30 days' notice, and that a dissatisfied employer shall likewise refrain from dismissing; (5), that the award shall continue in force one year, no new arbitration on the same subject to be had during the year. Where there is no brotherhood, individual employees shall not be bound by the award unless they have given assent in writing.

Under Section 4 the award goes into effect 10 days after being filed in the court, unless one of the parties shall have filed exceptions for matter of law apparent upon the records. Appeal may be taken to the Circuit Court of Appeals, but no higher.

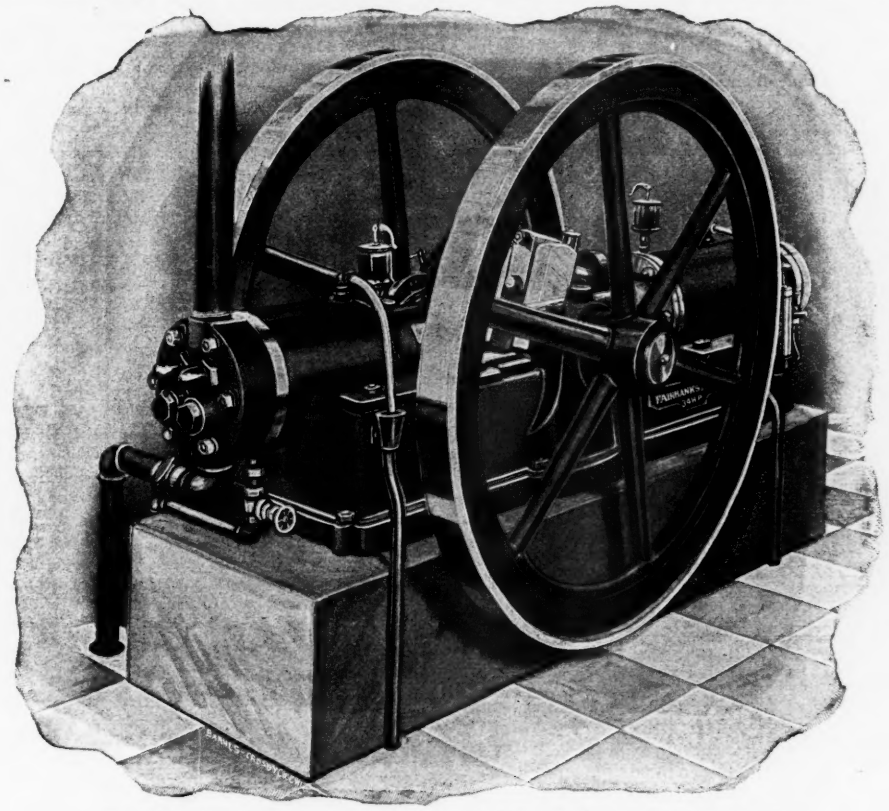
Under Section 5 the arbitrators may "require" attendance, and the production of papers material to a just determination, etc., but to compel attendance, etc., recourse must be had to the United States Courts, the Board being, in this respect, under the same limitations as the Interstate Commerce Commission.

Section 6 provides that individual employees, not a brotherhood, must satisfy the Chairman of the Interstate Commerce Commission that the employees acting really represent a majority, and that an award "can be justly regarded as binding upon all such employees."

Section 7. During the pendency of arbitration it shall be unlawful to discharge, except for inefficiency, violation of law or neglect of duty; it shall also be unlawful for the brotherhood to order or the employees to unite in a strike. For three months after an award an employer must not discharge, except for the causes aforesaid, without 30 days' notice, nor for employees to quit, without just cause, without the same notice. Any violation of this section subjects the offender to liability for damages; but dismissals on account of falling off in business are not forbidden.

Under Section 9 employees of a road in the hands of a receiver appointed by a Federal Court shall have the right to be heard in such courts, through the officers of their associations, on all questions affecting the conditions of their employment, and the receiver shall reduce wages only by the authority of the court and after 20 days' notice.

Section 10. An employer must not require an employee or an applicant to agree to keep out of labor organizations or to contribute to any beneficial or other fund, or to release the employer from liability for personal injury by reason of any benefit received through such fund, beyond the proportion contributed by the employer. To attempt or conspire to prevent a discharged employee from obtaining employment is a misdemeanor, subject to $1,000 fine.



The Fairbanks, Morse & Co. Direct Connected Gas Engine and Air Compressor.

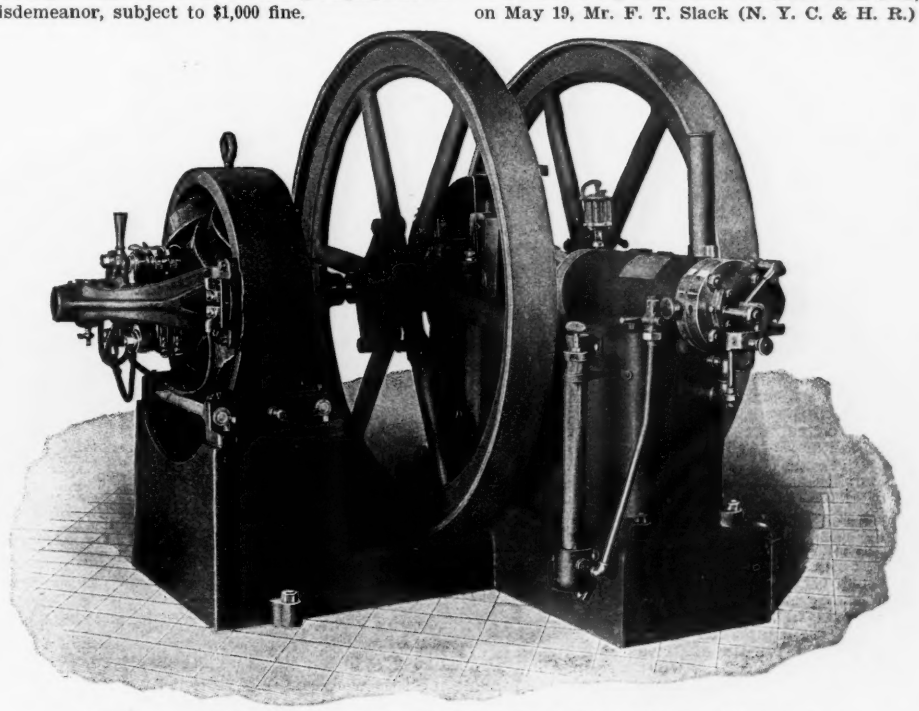
Section 11 provides for compensation of arbitrators. Section 12 repeals the arbitration law of Oct. 1, 1888.

Some Special Types of Gas and Gasoline Engines.

The development of the gas engine industry of recent years has been such as to warrant the building of gas and gasoline engines direct connected to special machinery, and in our issue of Aug. 20, last, in describing the construction and operation of the standard engine made by Fairbanks, Morse & Co., combinations were mentioned of this engine with a water pump and with a hoisting drum mounted in each case on the engine bed. This company has since brought out two other self-contained combinations of the gas engine, one in connection with an air compressor, and the other an electric generator, which special types are shown by the accompanying engravings.

The air compressors are built in three sizes, of 12, 22 and 34 H. P., weighing 4,600 lbs., 8,900 lbs. and 14,000 lbs., and deliver, respectively, at a pressure of 80 lbs. per sq. in., 70, 123 and 182 cu. ft. of free air per minute; the floor space required for the smallest compressor is 38x100 in., for the intermediate size 45x123 in., and for the largest size 52x131 in. It will be seen from the illustrations that the two cylinders are arranged tandem, so that power is transmitted direct from the engine piston to the piston of the air compressor, making a direct end thrust, and relieving the shaft of the usual torsional stresses. A pair of heavy fly wheels mounted on a crank axle and driven by a short connecting rod insures a uniform speed and uniform length of stroke. The sides and head of the air cylinder are water jacketed, and as the compressor is single acting the valves are all placed in the cylinder head; each valve together with its seat can readily be removed by unscrewing a large plug. The compressor is fitted with a mechanically operated unloading valve, which acts whenever the pressure in the receiver becomes that at which the relief valve is set; this removes the load from the engine, and the governor then operates to cut off the supply of gasoline or gas, only admitting enough to maintain the speed. The engine proper is essentially the same as those made by this company for other purposes and previously described.

The combination for electric lighting of a gas or gasoline engine and generator on the same base, as shown, consists of a standard Fairbanks-Morse engine provided with a specially designed, sensitive governor which works on the hit-and-miss principle. A feature of this machine is the coupling between the engine shaft and that of the generator, which is flexible, connections being made at two opposite points on the spokes of the fly wheel. At one point a link is used, and at the other a spring, so that the armature shaft is allowed a small amount of end play, and perfect alignment of the two shafts is not necessary for good working. This combination is built in sizes ranging from 5 to 25 H. P., and it has been found that the variation of speed between full and friction load does not exceed 1 per cent. The same style of engine is also furnished without the direct connected generator, and with driver wheels of sufficient width to permit of direct belting from the engine to the pulley of a standard dynamo. The engines are now used in many small shops for lighting purposes, and have been found to be both economical and satisfactory.



Direct Connected Gas Engine and Electric Generator, Built by Fairbanks, Morse & Co.

Cleaning Passenger Cars.

At the meeting of the New York Railroad Club, held on May 19, Mr. F. T. Slack (N. Y. C. & H. R.) presented a paper on the methods of cleaning passenger cars, with a discussion of the cost of different plans and different cleaning materials, accompanied by detailed estimates of the cost per car in a large yard, based on his own experience.

For a very dirty baggage car, or any vehicle which has been long neglected, a 20 per cent. solution of muriatic acid should be used on the outside, but as

the acid will quickly destroy the varnish if not used with care, the work should be done only by an experienced man. When washing with acids old panels should be used to experiment on. Oxalic acid, less powerful, may be used where cars are not so dirty. There is no use in trying to wash the outside of cars without soap of some kind. Mr. Slack emphasized the importance of care in cleaning platforms and steps. Work here pays because it is particularly appreciated by passengers. A sponge is better than a mop for some parts of this work.

Trucks should be cleaned with a solution of caustic soda, quickly rinsed off with hot water. Kerosene oil is sometimes used, but enough oil adheres to the surfaces to collect dust afterward. Outside cleaners are sometimes careless in washing window sills, and these should be cleaned by hand every other day.

For cars running 150 miles a day Mr. Slack recommends a daily cleaning throughout, except the head linings and deck sash. Once a month the car should be laid off and these parts cleaned; an additional thorough cleaning with soap should then be made if necessary. The use of compressed air for dusting "saves 10 per cent. in time and 90 per cent. in thoroughness."

Floors should be mopped with hot water in winter and cold water in summer. A triangular scraper should be used for getting dirt out of corners, and a long hook with a broad end for reaching under steam pipes. Steam pipes should be thoroughly cleaned from all filth, as the heating of the pipes quickly fouls the atmosphere if they are not clean. Floors of toilet closets should be scrubbed with strong soapsuds and the hopper and urinal should have a 50 per cent. solution of muriatic acid. Blue vitriol is also good. Soap used in closets should have in it some oil of sassafras, which is free from the disagreeable odor found in soaps containing carbolic acid. Mr. Slack uses for closets a soap which he makes, at a cost of 45 cents per 100 lbs.

For disinfecting against contagious diseases Mr. Slack recommends the regulations of the United States marine hospital service, which give detailed directions for the generation and use of formaldehyde.

For rubbing inside woodwork, cheese cloth is better than waste, as it leaves no lint. It costs but a trifle more. Mr. Slack emphasizes the importance of cleaning windows, but does not seem to have a decided choice as between a number of acceptable methods. The water tank should be cleaned daily, the glasses washed and polished, and in winter the drip pipe should have a lump of salt. White castile soap is good for cleaning wood head linings.

The paper closes with a list of the tools and materials needed for cleaning a passenger car, and an estimate of the number of minutes and the cost per hour for each of the eight different classes of work that must be done on a car daily. In addition to this there are four jobs that ought to be done once a week. The aggregate of the daily work is 3 hours 45 minutes, and the cost 43 cents, most of the work being paid for at the rate of 13 cents an hour. The work done weekly aggregates about 700 minutes, or 105 minutes a day, making the average cost per day 22 cents.

Suggestions for Standard Interlocking Apparatus.

The committee appointed by the Railway Signaling Club, at the New York meeting last autumn, has made its report on the questions presented by Mr. H. M. Sperry, in his paper read before the Club a year ago. The committee consisted of Messrs. A. H. Rudd, W. W. Young and Frank Rhea. The present recommendations are based on twenty-three replies to a circular sent to all members.

"Switches should be designed specially for interlocking work, having a lock rod at the point and a switch rod on the opposite side of the head tie, the center of the switch rod being 14 in. from the point; connection to be made by a threaded rod with jamnuts on each side of a cage furnished with thimbles, to prevent wear to threads and allowing a play not to exceed 2 in.; the thimble to be riveted to the center of the switch or head-rod in all cases where ties can be properly tamped, and adjustment is easy of access. In all other cases, as, for instance, at slips, etc., the end of switch rod should be bent down at right angles, and a rod passed through it, instead of a cage, bringing the adjustment beyond the end of the ties. Instead of the usual tang at the end of the threaded rod, an eye engaged with a screw jaw will be found very convenient for adjusting the switch when no change of throw is required and for furnishing a jointed instead of a rigid rod. These latter devices should be used only when limited room requires their employment, as they are complicated, difficult to maintain from a trackman's standpoint and hard to protect properly with bars. For their operation we advocate rocker shafts with arms set-screwed or pinned from the top, leaving a smooth surface on the under side, where ice usually forms, and having bearings designed to bring the shafts as near the base of rail as the length of the arms will safely permit. Only in isolated cases of single slips will cranks be found preferable. We recommend the outside facing-point lock with nearly straight lock rod, having a screw jaw at one end connected to a lug on the front rod, this front rod in turn having a screw jaw at one end where it catches the foot. By this means the throw of the switch can always be kept the same within small limits by varying distances between points, effecting a saving in labor of washering-out the points, etc., and making all lock rods interchangeable (a marked advantage in case of wrecks).

"We recommend connecting to the two outer points of a slip, as to a plain switch, the two inside points to be held rigid by an adjustable rod. If in addition to the above, a slotted foot is used on one of the outside points, all ordinary variation is provided for. For operating the detector bar, a screw or straight jaw is recommended in connection with a lug riveted to the bar, thus doing away with studs that work loose. We also suggest that bars be made in three sections bolted together, so that one man can make all necessary repairs. Each signal department should carry a stock of standard rail braces for use at switch points with detector bars, and a majority of the roads now have them.

"We recommend in all new work separate levers for all signals, and that selectors be used only for slow speed routes in yards where indicators are used. We also recommend the use of bolt locks or their equivalent, placed in the connections of all high speed signals and protecting all facing-point switches in these routes. In order to avoid complication of connections, we suggest centering springs where facing points are beyond the tower; or, if switch levers are heavily loaded, the employment of electric locks to be withdrawn when the switch is thrown more than three-quarters home, thus obviating the necessity of careful adjustment of the electric lock itself. An interlocking facing-point lock recently devised could be used advantageously in many places.

"We recommend as a standard easily adopted by all roads, a distance of 5 ft. 6 in. between centers of semaphore arms, with 5 ft. blades for high speed arms and 3 ft. 6 in. for short arms when used; pipe connections to all home signals, and to distant signals where the run is not too long for operation; wire to dwarf signals if idle jaw is used for operating them.

"Iron poles are favorably spoken of by all who use them. We would recommend that they be made of trolley pole pipe and set in cement on the lines of Mr. Elliott's design, which we believe represents the best practice.

"Levers should be grouped in small machines with signals on the ends, switches and locks in the middle. In large machines they should be grouped as best facilitates manipulation.

"Train order signals should release distants, mechanically if in the same frame, electrically if otherwise. We recommend that engineers report all distant signals found against them, and rear brakemen all signals not set to protect them after passing a stated distance. Mr. Sperry advises that he has an automatic checking device for distant signals.

"We recommend that all signals not plainly seen from the tower be provided with repeaters requiring only two wires; contact when closed, holding arms horizontal. Any opening of the circuit due to a broken wire or an arm drooping will allow the indicator to drop to clear by gravity; it is cheap and effective and a bell can be added if desired.

"As to tower details, we suggest wooden towers having 6 in. x 4 in. studding, 6 in. x 6 in. corners, diagonally boarded, covered with building paper and standard outside finish. The second story floor boards should be laid parallel with the level throw and trap doors should be placed at the front of the machine (towards track), with horizontal locking openings in the tower ends for taking out long locking bars; movable transoms over windows and doors (being left out where large diagrams are used); swing or sliding windows coming down to the floor; downstairs, small openings opposite the machine legs for the long locking bars where vertical locking is used; lead-out timbers 4 in. x 12 in.; machine frame 5 in. x 10 in.; machine and tower on separate foundations; steel girder frames for large machines and lead-outs; these girders or timbers to be built into the front and the machine foundation walls and supported on concrete piers at the outer end; a wall to be built around the lead-out inside and outside of the tower with enough space under the planks to work in comfortably; stairs where possible inside on account of ice and snow; toilet conveniences to be furnished always. Illuminated tower numbers are a great convenience, made by placing opal glass in the openings left in the tower ends for taking out locking bars; and beveled foot-boards are desirable where bed plates are of flat design."

Annual Report of Japanese Railroad Bureau.

The annual report of the Imperial Railroad Bureau of Japan for the year ending March 31, 1897, has just been published. Owing to its date, much of the matter cannot be regarded as news, but we have abstracted some items which are interesting.

Twelve pages are devoted to new building. Later information, but without some of the details given in the report, has appeared in the Railroad Gazette (see August 27, 1897, and March 4, 1898). The railroads sustained considerable damage from floods. The Tokaido, or main line, suffered most, traffic having been suspended on one section for 10 days.

Six locomotives were bought from Neilson & Co. of Glasgow, Scotland, and four were built at the Kobe shops of the Imperial Government railroads. The average amount of coal consumed a mile by the foreign engines ranged from 29.5 to 39.9 pounds, against from 55 to 67.3 consumed by the engines built by the road. The average amount of oil used per 100 miles varied from 10.3 to 15.2 pints in the former, and from 21 to 36.2 pints in the latter case. In commenting on this difference the report says: "The enormous amount of coal consumed by the newly constructed locomotives, as compared with imported locomotives, is due to the fact that the former were run on gradient lines, and the greater average amount of oil consumed as compared with the foreign made ones is due not only to the fact that the newly constructed locomotives were run on gradient lines, but that, to prevent their being heated at the beginning of their use, from want of smoothness on every friction surface, a naturally greater quantity of oil was required, while the imported engines needed less oil, as they were in work almost a year before. The figures for the newly constructed locomotives show the average of the time only when a great quantity of oil was needed, owing to their having been newly constructed."

At the Shimbashi (Tokio) shops, 28 passenger and five freight cars, 65 pairs of wheels and axles for a light railroad, one set of interlocking signal apparatus and articles of more than 150 different varieties, including slotting machines, screw cutting lathes and dating presses, were turned out. Six bridge girders 60 ft. long, two girders 70 ft. long and 27 girders 15 ft. long were also finished; 89 freight cars were rebuilt. The Kobe shops turned out in addition to the four locomotives, 44 passenger cars, 1,000 hammered iron sledges, 260 pairs of wheels and axles for light railroads and 12 spans of bridge girders, besides numerous other articles, including lathe screws, drilling machines, portable cranes and signal appliances. Very little work was done at the Negano workshop. Considerable repairs were made to equipment at all three shops.

At the end of the fiscal year the Imperial Government railroads had 631 miles of railroad open to traffic and 239 miles additional built. The equipment consisted of 183 locomotives, 776 passenger cars and 2,328 freight cars. The working mileage of locomotives during the year is given at 5,660,456 miles. The coal consumed was 1,941,372 cwt., an average of 38.41 lbs. per mile; the oil used was 833,514 pints, an average of 14.73 pints per 100 miles. The average mileage per car was 30,597 miles, or an average daily operative mileage of 84 miles per car.

The number of passengers carried on the Government railroads was 22,750,749, of which 152,288 were first class, 1,452,290 second class and 21,146,171 third class, an increase of 3,986,362, or 21.2 per cent. over the same period of the previous fiscal year. The average number of passengers per train mile was 174.3, and per car mile 13.16. The freight carried was 1,266,119 tons, an increase of 166,060 tons, or 15.1 per cent; parcels, carriages, horses, dogs and other small animals, amounting to 10,720 tons were carried, an increase of 2,634 tons, or 32.6 per cent.

There were few accidents on the Government roads, and none of importance. The total number of employes killed was 14, injured 37; 134 other persons were killed and 50 injured; seven passengers were injured.

The total receipts for the year were $4,136,825 against $4,002,116 for the last fiscal year, an increase of $134,709, or 3.4 per cent. The operating expenses were $1,907,831, against $1,475,780 for the preceding year, an increase of $432,051, or 29.3 per cent. The net earnings were $2,228,994, a decrease of $297,342, or 11.8 per cent.

Charters were granted to 19 companies aggregating 520 miles and representing a capital of $12,380,000. Of these charters, two were granted to existing companies and 17 for proposed new lines. Provisional charters were granted to 38 roads, representing 1,438 miles and a capital of $32,764,023; nine were granted to companies already organized. Five new railroads were opened for traffic, together with six extensions of existing lines. At the end of the year under review, existing joint stock companies numbered 51, with an aggregate capital of $76,110,000, of which $47,984,489 were paid in, and a mileage of 2,972 miles, of which 1,642 miles were working. The total number of passengers carried on all the private railroads was 42,714,260, against 29,689,472 for the previous year, an increase of 13,024,788 or 43.9 per cent. The freight carried amounted to 4,931,907 tons, against 3,641,523 tons for the year previous, an increase of 1,290,384 tons, or 35.4 per cent. In addition 13,859 tons of passengers' luggage and small parcels, for which an extra charge is made, were carried, against 11,988 tons for the preceding year, an increase of 1,871 tons or 15.6 per cent. The total passenger mileage was 615,659,878 miles, and freight 199,663,147 miles.

The total receipts of the private railroads amounted to $5,721,654 (in addition to subsidies and special receipts aggregating $410,642); operating expenses, $2,338,104, and net earnings $3,383,550.

As in the case of the Government lines there were but few accidents on the private roads. The total passengers killed was six, injured 53; employes killed 31, injured 83; other persons killed, 273, injured 123; a total of 310 killed and 259 injured.

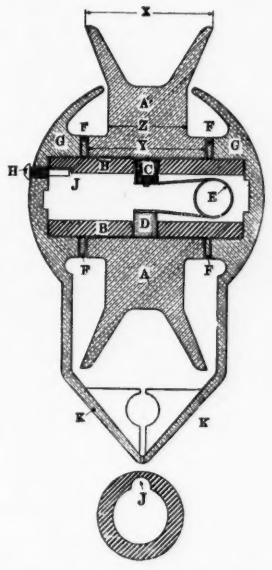
Accompanying the report is a large map showing existing and proposed lines, with a list of all the Government and private lines, and their termini and length.

The Walker New Trolley.

In January last the United States Circuit Court of Appeals for the Second District rendered its decision affecting certain claims in the patent of Charles J. Van Depoele, granted April 11, 1893. By reason of this decision in its favor the Walker Company is again furnishing either a roller or pivotal trolley, and has brought out an improved form of its well-known pivotal type. The "Walker base" has been changed but little. The latching device is so made that it can be used or omitted, and thus adapted for either roller or pivotal trolleys. The main spring provides for an upward pressure of the wheel on the wire, and the auxiliary spring is designed to prevent a sudden upward motion of the pole in case the wheel leaves the wire. These two springs are carefully proportioned, and their base is so made as to allow the wheel to run close to the top of the car.

The accompanying illustration shows the trolley head. The wheel, A, is of phosphor-bronze. The

spindle, B, is made of steel, case hardened. In one end of this spindle is a small aperture, J, for receiving the end of the screw, H, which prevents the spindle from turning in the fork, G. The small copper plunger, C, which is attached to the wire spring, E, is placed on the inside of the spindle, projecting upward through an appropriate orifice, and bearing against the wheel. The iron plunger, D, projects downward through a similar orifice, and is provided with four recesses, or ducts, through which the grease passes to lubricate the wheel and spindle. The spring, E, forces the plungers, C and D, against the wheel, and maintains constant electrical contact between wheel and spindle, thereby preventing arcing in the trolley head. If, for any reason, the wheel is not properly lubricated, the friction resulting heats



The Walker Improved Trolley Wheel.

the copper plunger, C, which immediately softens the grease, causing it to flow through the ducts of the opposite plunger, where it restores the proper lubrication. FF are brass washers placed between the ends of the wheel hub and the fork, G. These washers are to prevent the wheel from wearing against the fork, and may be removed when worn out.

Middletown Dump Cars.

The engraving from a photograph shows a 4-wheel dump car as built by the Middletown Car Works, Middletown, Pa. These are made with bearings either inside or outside the frames, and for standard or narrow gage track.

The most striking novelty in the construction is the truck frame, which is made of a single channel bar, bent to shape, as shown in the photograph. This is braced longitudinally and crosswise with angle irons and with gusset plates at the corners. The supports for the rocker tracks are bars 6 in. x § in., the draft member is an I-beam of heavy section to which the drawbar and draft springs and followers are attached. These are swiveled at the back end to give facility in curving. The I-beams are fastened to the truck frame with angles at the bottom and strap braces at the top. All members are riveted, except the journal boxes, which are bolted to the frame. The rockers and rocker tracks are of cast steel. The wheels are 18 in. diameter on collarless steel axles. The height of the car is about 4 ft. 3 in. from top of rail to top of car, but it can be dumped at an angle of about 45 degrees. These cars are in use by several of the largest eastern brick makers and are said to be giving excellent results.

An Electrically Propelled Tower Car.

While the electric line in Fairmount Park, Philadelphia, was being built by the Fairmount Park Transportation Co., the J. G. Brill Co. made several tower cars for this road, which were somewhat novel in their construction. On this line it is impossible to use tower wagons because of the viaducts and also on account of the absence of any roadway along any part of the line. As seen from the accompanying engraving of one of these cars, the trolley pole is mounted on a separate stand. There are four stationary lights on the car and a single incandescent light for use on the tower. The car body is designed to hold the necessary fittings and tools and weighs complete 15,000 lbs. McCardell, West & Co. supplied the tower with the platform which is used. This platform has a 9 ft. reach and is placed in the middle of the car, thus reaching both the trolley wires on a double track. The length of the car is 12 ft., width 6 ft. 10 in. The truck has a 6-ft. wheel base and 36-in. wheels. The wide gage of 5 ft. 2½ in., which is used on this road gives a very broad support for the overhanging platform.

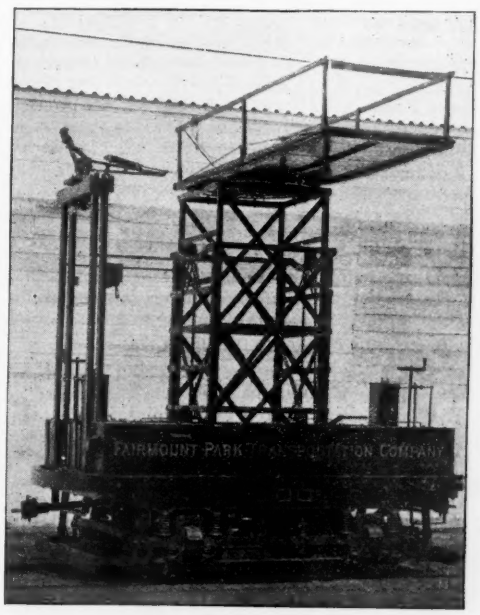
Motive Power—Past, Present and Future.

At the May meeting of the New York Railroad Club the subject was that of "Motive Power—Past, Present and Future." This was discussed by Mr. S. M. Vauclain, Superintendent of the Baldwin Locomotive Works; Mr. W. F. Merrill, Second Vice-President of the Erie Railroad; Mr. W. B. Potter, of the General Electric Co., and Mr. H. H. Vreeland, President of the Metropolitan Street Railway Company. Some extracts from the remarks of these gentlemen follow.

By Mr. Vauclain.

Up until 1890 the Baldwin Locomotive Works had built steam motor cars for 62 different railroads, not only in the United States, but in countries all over the world, and in one city—Sydney, New South Wales—we had over 80 steam motor cars, doing all the city and suburban traffic of that large city. The Baldwin motor cars held the supremacy over all comers. After electricity commenced to sidetrack the horse cars and the cable cars, very naturally the steam cars on a great many of the city passenger car lines, and the short suburban lines followed suit and introduced electric motor cars where the outlay was warranted by the travel. These motor cars were separate from the passenger cars. They were housed to imitate the ordinary street car or suburban passenger coach, and, to all appearances, two or three suburban passenger cars were going along without any visible means of propulsion. The noise was drowned by exhausting into a condenser or exhaust chamber, the steam passing up the smoke-stack, highly heated, disappeared, except when the weather was very unfavorable, and the motor was then often enveloped in a cloud of steam.

These motors were operated very economically indeed. In some service—most notably suburban service in Kansas City—the performance for all expenses, repairs, wages, etc., in maintenance, averaged $0.0566 per mile run. This was much cheaper than that of horse cars or any other system of propulsion that had been brought to the attention of railroad people. The grades, as you know—any of you who have been in Kansas City—are for the maximum of about 5 to 5½ per cent., which is very much greater than we find now on ordinary suburban roads. After the electric motor had driven the steam motor out of service to a great extent—we probably build half a dozen each

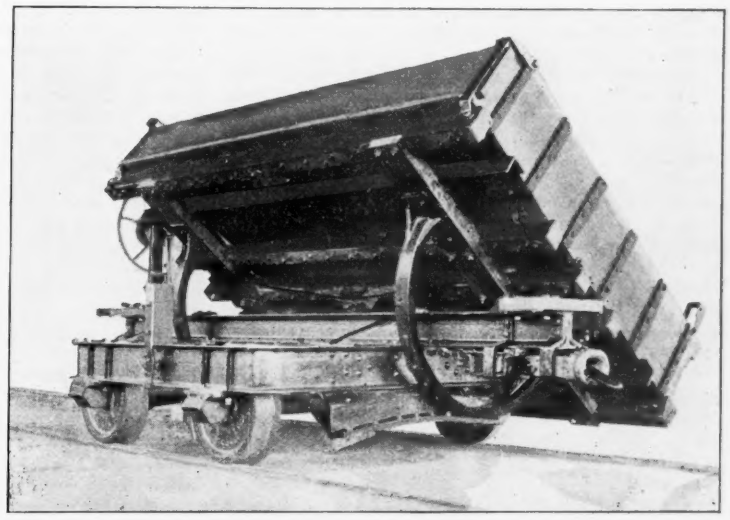


Tower Car, Built by J. G. Brill & Co.

year at the present time for various suburban roads—for a time the manufacture of these street motor cars ceased

Recently we have been confronted with a new phase to the situation. The large railroads had been operating, and some of them are now, short suburban lines, where the traffic is so light that they are not warranted in keeping up a full or regular passenger service, and their desire is to have a motor car that can be operated by two men that will handle all the passenger traffic, and sometimes the freight traffic also.

There are certain requirements for a successful motor car. In the first place, the car must be economical. It must be so arranged that it can be handled by one man; that is, the fire can be attended to and all the other necessary details can be looked after by the engineer comfortably. The man must not be put to any inconvenience or he does not want the car, or he wants some one to help him, and if he does not have what he wants he is dissatisfied, and liable not to give his best service. The car should be noiseless, and practically free from throwing fire. If it is not noiseless, the passengers raise questions; and, if not free from throwing fire, the country suffers the same as from ordinary locomotives. These problems have to be met and solved by the builder of the machine.



Four-Wheeled Dump Car—Middletown Car Works.

Again, the motor car must be cheap. It must not be made so expensive that it will not pay the railroad company to buy it and operate it and keep it in repair. The first inquiry that came to us was from the C. H. & D. R. R. for a noiseless steam motor car. We built a steam motor car, and it was sent out upon that railroad. But it would not do. The engineer had to put the blower on once or twice, and that would not do. The engineer could not undertake to fire the boiler, as it took all of his time to run the engine, and look out that he did not run over children, cows, etc., because the whole neighborhood turned out to see the car. I went out to see what was the best thing to do, and thought it best to take the machine home. [See Railroad Gazette, p. 153, March 4, for illustrations and description.]

We adopted what we call a "Magazine Boiler." It has a magazine at the top surrounding the smoke-stack, and is charged with fuel enough for the round trip of 30, 40 or 60 miles, as the case may be. [See the Railroad Gazette, p. 177, March 11, for illustrations and description.]

In order to meet the requirements of larger roads we designed a different type. This car is now being built at our works for the Detroit & Lima Northern Railroad, to make a speed of 45 miles per hour, and to haul two additional ordinary passenger cars. This work cannot be done without considerable power. The power necessary to do the maximum work is about 250 H. P. We figure that we can do that very successfully with a compound engine and a boiler of this type, having not over 2½ sq. ft. H. P. So that, by doubling that, we think we have a reasonable margin to enable the engineer to quietly attend to his engine and let the boiler take care of itself. The interior construction of this boiler is similar to the one just described, although larger, and the feed-pipe is larger. The engine is the ordinary four-wheel engine, but the boiler is set back of the center-line, in order to equalize the load that necessarily comes on the front wheels from the cylinders. The engineer's place is in the forward compartment. The links are taken out of the usual position and placed in a vertical position, so that the engineer can take care of and oil all parts of the machinery without getting out of the cab. The coal is placed in the reservoir at the top. Its capacity is about two tons, and this can be enlarged, if required, but so far we have not met with any service that required any additional amount.

If the car were to be supported on a large center-pin—it is evident to any of you who have had any experience with such an arrangement that there would be considerable strain in the car body and the car would be very bad to ride in—the engine being very heavy and the spring rigging naturally rigid, any jolt or jar in the roadbed would be immediately transferred to the body of the car and to the passengers, to say nothing of the discomfort of the engineer, and if the engineer is made uncomfortable, whether the passengers are uncomfortable or not, it is difficult to keep him. In order to obviate that, we have supported the car body on the boiler with suspension springs. [See Railroad Gazette, p. 177.]

I found it very difficult to get at the link motion on the C., H. & D. car, and, thinking that the engineer who might be assigned to that car would take the

same view of it, we thought we would provide a method to take out the dirt, prevent wear and reduce the maintenance and care of it by putting it under the eye of the engineer at all times, so that the least thing out of the way could be noticed before having a general smash-up. In order to do this it was necessary to reverse the fittings, and, instead of having the valve motion parallel with the center-line of the engine, to have it at right angles to that line. There is no motion to it fore and aft, but only side motion, because the wheel rises and falls in the pedestal unequally, and, as the valve-motion frame is fastened to the axle, it responds in accordance therewith above, passing the center-line of the boiler to one side or the other, as the case may be. The motion is the regular Stephenson link-motion, and it is brought down and changed from vertical to horizontal by a rock-shaft. You will notice the connection to the valve-rod. Some of you may notice the end of the valve-rod has a connection on the end of it fitted between the slide and the end of the rock-shaft, and an ordinary slide-block, such as the Stephenson link has in it, which is free to travel in a vertical direction. This vertical motion is allowed on account of the rise and fall of the axle in relation to the frames, and, as the axle rises and falls, so does the frame to which the link motion is attached rise and fall. By this action the travel of the valve is not at all affected by the rise and fall of the axle, and will give us at all times, under all conditions, a good valve motion and a good distribution of steam in the machine.

This is about the extent of our experience in designing and building composite steam motor cars. The last car which I have shown will be ready for service about the 1st of July, and then we will know more about it.

In conclusion I would like to suggest an idea that I have had in regard to this question. It is apparent to you that a car, 55 to 60 ft. in length, requires considerable house room, and when the engine is to be repaired the whole car lies idle, and the repair shops must be made larger or the work must be done in the passenger car shops, and, with a car of this kind, it is rather difficult to take everything out of it to give it repairs. It has occurred to me that, since the vestibule has been brought out, the same thing could be accomplished by having a similar motor, vestibuled and attached to a car, so that there would be a passage way between the two that could be opened or closed, as desired.

By Mr. Merrill.

As Mr. Vauclain has just said, the idea has prevailed that we did not want to run a big locomotive for one or two or three cars. Under the old system we had to do it, but we found we had to come to something that would run more cheaply, with less men and less coal, and that would bring down the cost of operation. I found out a little while ago that the Schenectady Locomotive Works were figuring on something to accomplish the purpose, and that my friend, Mr. C. Peter Clark, was building a motor that would carry quite a large number of passengers, would have only one car, and require only one man to run the engine, and one man to run the train. That would let him take off three men. I thought that was a pretty good thing. So we got hold of Mr. Ellis and asked him how he was getting along. He said he did not know; we had better wait awhile. But I told him it was necessary for us to have it at once, and so he put his motor in front of an immigrant passenger coach which we had been holding on the sidetrack. When it came out with the motor in we took it to the Buffalo shops and finished it up, and then started to run it on one of our little branches four miles long, and from that on to another line. While there are some things about it that may possibly need changing, we have had good results from it. No doubt, in the course of time, some one will get up something to beat that. Our motor can be operated for a little less than 16 cents a mile, which includes all labor on it, repairs, all labor on the train, fuel, oil, and everything. To run one of our locomotives with a combination car and a coach costs about 27 cents a mile. In the month of March this motor of ours ran 2,430 odd miles. If we can save 11 cents a mile on 2,430 miles, it means quite a little money. It means about $260 a month, and that is a large interest on the cost of the car. Of course, the cost of the car depends a good deal on the kind of coach one uses. We had this immigrant car on hand. The whole cost was in the vicinity of $10,000. On the whole, we are well pleased with this motor, and we think it is a move in the right direction. I suppose we have on the Erie five or six different places where these motors would come in excellent use, and where we could save quite a large amount of money, which is the main thing we are after.

By Mr. Potter.

I was very much interested in Mr. Vauclain's and Mr. Merrill's remarks with regard to the independent steam motor car, and undoubtedly that class of car will fill a place where electricity can hardly be expected to meet the requirements, and where the ordinary steam train service would be out of place, as, for instance, where one or two trips are made throughout the day. With conditions, however, of suburban traffic to be met and trains frequently operated, say, every hour or half-hour, electricity has unquestionable advantages.

A good instance is that of the Lorain & Cleveland trolley road, which is about 29 miles long, eight miles of which is in the city of Cleveland, and 21 miles between Cleveland and Lorain. They are regularly running between those cities on a schedule of an hour and a half, and have done it on trial within the hour, and when you consider that the schedule covers eight miles inside the city, with city limitations, it is a result probably impossible in steam railroad practice. In the operation of these cars there is required, in starting, something like 400 to 500 H. P., as the acceleration is very rapid, and when running at speed about 125 H. P.

Each of the four axles is equipped with a motor, and the car also has the electric brake, and I might say in that connection that it will be interesting to steam road men to know that at night, when running from 40 to 50 miles an hour, they stop for a passenger at the flare of a match scratched on the rail.

For this class of service there seems to be a special advantage in having a motor on each axle. On the road between Cleveland and Painesville the cars have been equipped with only two motors, but having the same total capacity as the four just referred to, and the company find that during winter, when there is snow on the track, they do not get sufficient traction with motors on only two axles, and they are now arranging to replace the two motors by four smaller ones.

A similar service is that between Buffalo and Niagara Falls, which, by the way, is operated from the Falls plant, the current being generated as a three-phase alternating and transmitted at 10,000 volts to Buffalo and used to drive cars in Buffalo and the cars between there and Niagara Falls.

In this same connection there will shortly be operated from Niagara Falls what is practically equivalent to steam road service, cars similar to the C. & L. cars, giving a speed of 40 to 50 miles per hour, and also 40-ton electric locomotives to haul freight trains, so that there will soon be accomplished by energy from the Falls the varied service of the ordinary trolley road, the suburban trolley, and also the train service as accomplished by the steam locomotive.

Touching the value of electricity for railroad work, the question of cost of operation is, of course, very important, and I think it may be fairly said that from the indicated horse-power of the engine to the mechanical energy at motor car, the efficiency of transformation will be from 50 per cent. to 55 per cent. Steam locomotives, including all losses, give about the same net efficiency as applied to hauling the trains. Assuming an equal net efficiency by both systems, you would have the advantage in the electric traction of the compound condensing engine, cheaper coal, and a type of boiler enabling you to burn your fuel to the best advantage.

Roughly estimated, I believe that a ton-mile can be operated by the electric system for less than one-half the cost for fuel and the total cost of electric power, including all power station expenses, would not exceed three-quarters the cost of coal for the steam locomotive.

In connection with water-powers and long-distance transmissions, I recently had occasion to prepare approximate plans and figures for the operation of very heavy trains over long, steep grades, the work in particular being overland trains across the Rocky Mountains.

I believe the company are now using three steam locomotives per train on this particular part of their line. The proposed plan contemplated a 20,000-volt transmission from water-power, static transformers all along the line reducing the potential to 5,000 volts, and a 5,000-volt trolley line, with static transformers on the electric locomotives reducing to 500 volts, the motor equipment being three-phase induction motors.

By Mr. Vreeland.

Before a body of engineers it would no doubt be interesting and profitable to go over this largely experimental history of the underground trolley up to the date of the installation of the present systems, but, as we are here to discuss the operating questions, I take it that a rehearsal of this kind would be a tax on your patience. When the history of these first attempts to develop the underground system into an effective means of propelling cars comes to be written, its most suggestive incident will probably be the manner in which the problem was attacked by the railroad men who at present own the Metropolitan Street Railway. The gentlemen who controlled this property, who have done more to advance urban traction than any others in America, decided to offer a reward of $50,000 for a perfect system, and the result of that offer, made through the Board of State Railroad Commissioners, was a collection of what in all probability was the most extraordinary lot of suggestions ever called forth. I was the unhappy recipient of about 2,800 methods for operating our lines, and was snowed under a shower of blue prints and plans that fairly promised to smother me. However, I answered the authors of them all. One enthusiast had a plan for utilizing the rise and fall of the tides around the city for the purpose of generating current to operate the system. Another man from the West gave me a sketch, showing a car with a sort of treadmill on it, on each side of which elephants walked, and indicated in a footnote that if it was necessary to stop the car the conductor could shoot one of the elephants. Out of this great mass we received nothing that was of value, and so abandoned the hope of outside aid, and took up the question as an original one.

Owing to the dread of current leakage, it was deemed feasible to begin the operation of this road with 300 volts current, the idea being thus to minimize the leakage. As all the other roads of the country were standardized at 500 volts, this arrangement threw us a little out of gear, and experiments were immediately undertaken for the purpose of bringing the voltage to a point where it would be uniform with the standard then established. The abolition of the leakage was the result of installing thoroughly insulated positive and negative conductors. The superiority of this method of return over that in use in the overhead trolley, where the rails are used for the return, needs not to be mentioned to be appreciated by any one familiar with the subject. In fact, the reduction of cost of current by this method was so great as to largely justify the expense of installation.

The character of the sub-structure in which the Metropolitan Street Railway Company has installed its electrical conductors deserves, before proceeding with this subject, some comment. It is in every respect as substantial and heavy as that put down for the cable roads, and is capable of sustaining surface loads quite as great. While in the matter of weight the yokes binding the tracks are somewhat lighter, they are quite as efficient for all strains that the roadbed is called upon to sustain. When it is considered that at almost any point on the line the structure may be called upon at any moment to sustain loads of from 30 to 40 tons without injury, the stability of the work may be easily imagined. It goes without saying that suburban roads, or even city roads, with light traffic, could not justify the expenditure necessary for such construction as this, and in discussing this question and speaking of its adaptability elsewhere, I have, of course, always in mind large systems upon which great traffic is accommodated at almost all times during the working day. In further considering this question, it is always to be borne in mind that the Metropolitan Street Railway Company was further justified in this costly construction by the fact that it was original construction, and that the company was not in the position of many large systems that had already expended much capital in the change from horse to overhead trolley. In this respect we had the advantage of the costly experiments of others, and it would be obviously unfair to insist that because the system has proven a success with us it should be adapted everywhere else, because the enlargement of the capital account upon which interest must be earned would make it in many cases prohibitory.

As to the future of electric power, applied to general railroad operation, it is plain to see that the electric current will not long remain the sole possession of the street railroad man. Already great strides have been made in its application to both yard and line work, and I have no doubt that the next few years will see the continued extension of the application of electric currents to lines of this kind. It is not at all inconceivable that your children and mine will look back upon these boasts of ours, made tonight, with the same indulgent smile that we bestow upon the first small efforts of Morse.

Some of the Railroads of South America.

Notes by a Practical Railroader.

As I have lived in Chile nearly two years and only just returned, I wish to put down for the benefit of American railroad men some of the impressions that are still fresh in my mind.

The railroads of Chile are mostly owned by the Government and worked at a loss. Probably there are twice as many employees as are needed, but the pay is very low; for instance, in American money, enginemen get from $40 to $60 a month; brakemen, from $12 to $20. There are, however, some American enginemen sent out especially to take charge of some Baldwin compounds, who have a special contract for a term of years at a good salary.

Living is not cheap, although at a superficial glance it might seem so. For clothing you can do better with the same money in any North American city, and you have to pay high prices for good rooms and for food.

The enginemen are generally not very competent, and places are secured by improper means. The wear and tear on the engines is heavy. Employees, especially conductors, rob the company right and left, and the railroad at large is very much a political engine.

The early Chilean engines came from England, and you can still see locomotives of 1841 switching in the yards. Of course they have inside cylinders and they still do pretty good service. On the Valparaiso-Santiago section, the locomotives are old English engines from Wolverhampton, with a good many from Scotland, built along in 1875. They look much like an

ordinary American engine, except that the cylinders are inside. Of late years Baldwin, Rogers and Cooke have virtually supplanted the English and Scotch engines. In the last five years the Chileans have built some fine engines themselves, some of them being close imitations of Rogers' moguls and others built after the high speed English passenger engines, which are doing splendid service. On the whole, the Chileans have probably saved money on the engines that they have built.

The Chilean mechanic is going ahead fast. If the European or American mechanic expects to go to Chile and compete, he will find that he has got to work against an intelligent rival. The fine Chilean navy is manned almost exclusively by Chileans, many of whom have received a thorough training in England. A good machinist gets from $1.50 to $2 a day in the government railroad shops, and the labor market is overcrowded. Freight cars are made in Chile, generally with wrought iron wheels, though a few cast iron wheels have lately been received from the United States. The passenger cars also are mostly made at home. The Westinghouse air brake is used on all passenger trains and a few freight trains.

The trains in Chile are moved more or less on the American plan, but orders are not so carefully worded, and nearly every day the Santiago express has to wait in a siding for a way freight which has a meeting order.

Cars are nearly all of the American style; old English cars are being used, too, for local traffic.

In Peru petroleum is used almost exclusively for engine fuel; it is pumped from the wells for very long distances. An ordinary Rogers mogul tank filled with petroleum takes four passenger cars from Callao to Oroya and back. The Superintendent told me they like the fuel very much; formerly they lost much coal by theft and waste. The petroleum is cheaper, but hard on the fireboxes, but they have good shops at Callao. In Peru the pay is a little better than in Chile, especially on the Oroya railroad.

The railroad system of Ecuador consists of 40 miles, from Duran to Chimbo, along the River Guayas. Duran is opposite Guayaquil, Ecuador's port and largest city, to which port ocean steamers come 60 miles up the river. The projected line to Quito, 350 miles, will be very costly and difficult, as Quito is the highest city in the world. I am told that more than 400 bridges will be needed. It was announced last September that a syndicate of New York capitalists had made terms to build this line at once, but nothing was known about it when I passed through Guayaquil March 27.

The Passaic Rolling Mill Explosion.

In concluding our account of the boiler explosion at the Passaic Rolling Mills, Paterson, N. J., which occurred on May 4, we remarked that "further investigation may reveal some facts which may lead to a true explanation of the cause of the explosion." We understand that none of the probable theories that have been advanced can be proved to be the certain cause, but the accompanying engravings taken from photographs after the explosion, for which we are indebted to the courtesy of Mr. W. O. Fayerweather, Vice-President and Treasurer of the company, show very well the effect of the explosion. The view on the right was taken looking north, and the space immediately in front of the partially destroyed building, as there shown, was entirely blown away. In fact, the two boilers which exploded completely cleared the space at the center of the boiler room. The stack seen also in this view was uninjured, and the three boilers, which can hardly be detected in the view, but which lie at the north end of the boiler house, were only very slightly injured.

Ton-Mile Basis for Engine Service Statistics.*

By C. H. Quereau.

The ideal unit with which to measure the returns from the money invested in locomotive repairs and supplies is the work performed, shown by the horse-power developed, which is the unit used in careful tests to determine the efficiency of any steam motor. As the horse-power unit is made up of the elements of time, distance and weight moved, the perfect basis for motive power statistics should include these.

It is evident that the length of time an engine is in service is no proper measure of the cost of repairs, nor is the length of time required to burn a ton of coal a proper basis for determining fuel economy, because the basis of time does not include two essential elements of the work done, namely, distance and weight moved. The basis of time would be accurate only under almost impossible conditions—where the distance traveled and weights moved were constantly the same.

Though the basis of cost per mile is in almost universal use, it will be evident that the statistics derived from this basis are, in a large degree, as misleading and inaccurate as those based on time only, because no account is taken either of the weight moved or the time during which this work is done. For this reason statistics based on the mile will be inaccurate, and therefore misleading, except under the ideal conditions where the speed and loads moved are constant. Of the three factors which make up the work done by our engines, namely, time, distance and weight moved, it is impracticable, under service conditions, to obtain accurate data as to the time or speed element without incurring prohibitive expense. If our statistics are kept under the heads of passenger and freight, and the various runs classified under these heads, the variations due to the influence of speed will be greatly reduced. Assuming that it is impracticable, or inexpedient, to obtain statistics including the average speed under service conditions, and that by classifying our statistics we will reduce to a comparatively small amount the influence of this element, and in this way obtain nearly as accurate data as though we included it, we should look for a comparative basis which can be readily obtained and include the items of distance and weight moved.

The loaded car-mile basis roughly approximates these conditions, and is much more accurate than the mileage basis, but is far from ideal because of the great difference in the weights and capacities of cars—gives the same value to a load of straw hats and one of pig lead, and arbitrarily fixes the ratio between the weight of empties and loads. These objections have special force when a railroad handles both standard and narrow gage equipment. These objections do not apply to the ton-mile. I am aware that the ton-mileage as obtained under usual conditions is not absolutely accurate; that it does not take into account the difference in the power required to haul a ton of train in empty and loaded cars; that it does not provide for the fact that the difference between the power required to handle loads and empties at slow speeds and on grades is a small fraction of the difference in the power used for the same weight in empties and loads at high speeds and on level track; that it is difficult, if not impossible, to obtain accurate ton-mileage records of local and stock trains—in short, that ton-mileage records as they are obtained in service are far from perfect, but I believe what follows will show this basis to be considerably more accurate than the mileage basis, and that its use tends to encourage more economical methods of operating.

The statistics which follow are taken from the records of a western trunk line. That they cover only a short period of time is due to the fact that the examples used were originally prepared for reports made in the ordinary course of business, and lack of requisite time has prevented the compiling of records covering a longer period. I believe, however, the conclusions drawn would not have been different had longer periods been used.

I have stated that the ton-mile is a more accurate basis for engine statistics than the engine mile, because it is a more correct measure of the work done. An illustration will make this clear:

TABLE I.

March,	1896.	1897.	Increase per cent.
Average miles per engine	2,282	2,289	3-10
Average ton-miles per engine....	782,213	972,486	24

On the engine-mile basis the above statistics show that the engines did practically the same work in both 1896 and 1897, while those obtained from the ton-mile figure show an average increase of 24 per cent. in the work done.

Fuel.—Railroad men quite generally rely on the number of miles made to the ton of coal in determining the economy in the use of fuel. This basis is of comparatively little value, and may easily and naturally lead to wrong conclusions, because the fuel used is not compared with the work done. In Table 2 the branch line is a mountain road with numerous grades, maximum 3 per cent., and heavy and frequent curves, maximum 16 degrees, while that part east and west of division is considerably easier to operate. The three districts named cover the whole division:

TABLE 2.

Division D—January, 1896.

	Miles to Ton of Coal. 1 Lbs.	2 Per cent.	Coal per 100 Ton-Miles. 3 Lbs.	4 Per cent.
Passenger Service.				
Division point east.....	26.3	122	34.20	103
Division point west.....	32.1	100	33.09	100
Branch line	20.2	159	53.86	163
Whole division, average..	27.1	100	36.08	122
Freight Service.				
Division point east	16.6	100	20.79	100
Division point west.....	16.2	102	30.15	145
Branch line	14.8	112	67.93	327
Whole division, average..	16.1	168	27.40	100

Columns 2 and 4 may be considered as showing the number of pounds of coal used in doing the same work as determined by the records shown in columns 1 and 3 respectively. Under Passenger Service the first three lines in the same column are compared with one another, the best record being 100. The same is true under freight service. The fourth line under Passenger Service is compared with the same line under Freight Service.

If, under passenger service, we compare the performance of engine crews east of division point with those west, on the basis of miles made to the ton of coal, we find there is a difference of 22 per cent. in favor of those running west. There were but two main line passenger trains on Division D, one going west and one east, so that it would appear certain, to any one looking over the performance sheet, that the passenger crews east of division point were doing poor work. Any one specially familiar with the service on this division would know that a car was taken off the west-bound train and added to the east-bound train, both at A and B, and would therefore know that the enginemen east of division point were pulling more cars than those west, and be justified in concluding that the men east could not reasonably be expected to make as many miles to the ton of coal as those west of that point. It would, however, be next to impossible for any one to say just how much difference there should be. If this is true, when one is familiar with a division, it can readily be seen that a performance sheet based on the mile gives little reliable information. If a comparison is based on the ton mile, column 4, it will be seen there is a difference of but 3 per cent. east and west of division point, discovered that the ton mile takes into the account the extra work made necessary by the heavier trains, and that the crews east were doing about as economical work as those west.

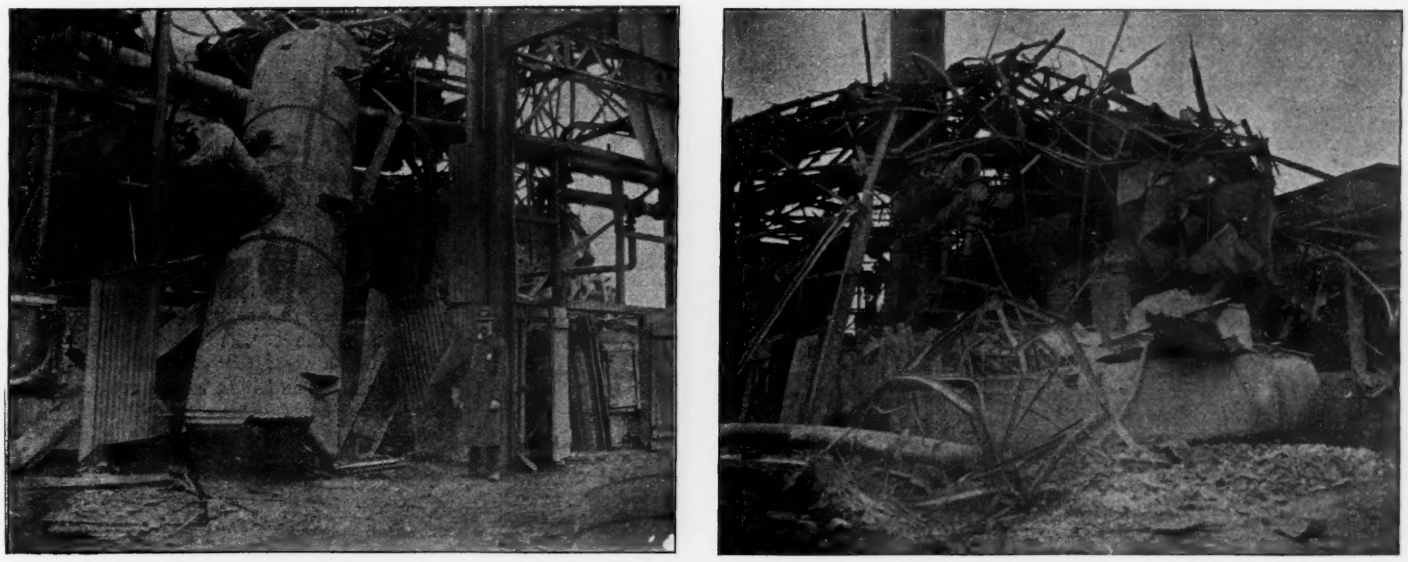
Consider the records made in freight service. An inspection of the miles made to the ton of coal on the branch line, in comparison with the main line east of division point, would naturally lead to the conclusion that it is costing only 12 per cent. more for coal on the branch line. This is found to be very far from correct when the figures based on the ton mile are used, as they show the cost on the branch line was more than three times that on the main line, and agrees with the common sense conclusion that the expense for fuel is very much greater on a mountain road than on a comparatively level line, which would not be guessed from the usual statistics based on the cost per mile.

It is quite commonly taken for granted that a passenger engineer will make a better coal record than one in freight service, because the former makes more miles to the ton of coal. An inspection of Table 2 bears this out, showing that the freight men made a record 68 per cent. poorer than those in passenger service, when judged by the number of miles made to the ton of coal. If, however, we compare the records made in the two services on the ton-mile basis, which has been shown to be a more nearly correct measure of the work done, we find the freight crews used coal 32 per cent. more economically than the crews in passenger service; a showing varying 100 per cent. from that made when the figures are based on the mile.

So long as the engine mile is the basis of comparison, any considerable increase in the train load will decrease the number of miles made to the ton of

(*Continued on page 378.*)

*From a paper presented at the April meeting of the Western Railway Club.



Views of Boiler House of the Pasaaic Rolling Mills, Paterson, N. J., After the Explosion on May 4.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

The excessively low rates that have prevailed on grain and other freight from the Western States to the Atlantic seaboard for the past few months have emphasized the fact that, broadly speaking, the supply of transportation is still in excess of the demand. Various reasons have been given for reducing rates when freight was plenty, as noted in our article on the subject April 29, but after all it is hard to avoid the conclusion that the ruling consideration is the fact that the capacity of the railroads, as a whole, is not yet reached. Car famines are, indeed, reported, but still the famine, like the financial famine in the Spanish treasury, seems not to have reached the farthest limit. When Spain really has used up all the money in sight she will probably be ready to stop fighting; and when our railroads unmistakably see traffic enough to keep their facilities fully utilized for a considerable time, they will probably stop bleeding themselves; or at least will make more determined efforts in that direction. These reflections are aroused by the report that the lines eastward from St. Paul are cutting rates on flour, in spite of the fact that they are all busy. The general merchandise is reported as very good, yet flour rates "were never more demoralized." The reporter making this statement says that the only remedy is to discharge a few high officials; but if he tries that he will have to go to the very highest—the president—and perhaps all the directors. The trouble at St. Paul probably is that, in spite of an apparently heavy freight movement in and near the cities, the lines to Duluth and to Lake Michigan ports are still capable of carrying 10 or 50 barrels of flour to every one barrel turned out by the mills. The observer (not a writer of long magazine articles), who summed up our complicated "railroad problem" in three words—"Too many railroads," still occupies a very strong position.

The railroads of the world, according to the statistics collected annually by the Archiv für Eisenbahnwesen, at the end of the year 1896, measured 445,064 miles, and the increase during that year was 1,111 miles, which is less than has been built in this country alone in certain single years, yet is something more than the increase in mileage in 1895. The parts of the world where there is most room for railroads, have in some cases built beyond the requirements of their present population, notably Austria, which added but 14 miles to its system in 1896. The proportion of growth was large in Asia, owing largely to the building of the Siberian Railroad; yet the addition of 6 per cent. made in that quarter of the globe amounted to but 1,618 miles. Africa increased its system 1,025 miles, or 12½ per cent., in 1896, about half of it being in the French colonies of Algiers and Tunis, and more than a third various short lines on the coast, which are signs of a serious invasion of the Dark Continent by European commerce. An addition of only four miles is reported for British India, which is certainly a mistake, and we have corrected it. The Indian Administration Reports give miles open Dec. 31, as 20,173, and we have used the figure there given. During the year there was a gain of 707 miles. Next to Siberia and India the largest Asiatic addition was—imagine it!—in Turkey. Asia Minor and Syria are credited with 1,558 miles in 1896, against 1,100 mils in 1895; and this again we hesitate to believe. Japan's progress has been slower than most of us supposed, the mileage at the close of each of the five years ending with 1896 having been as follows:

1892.	1893.	1894.	1895.	1896.
1,876	2,017	2,236	2,236	2,290

In the chief European countries the additions in 1896 were: Germany, 581 miles (2 per cent.); Austria-Hungary, 807 miles (4.2 per cent.); France, 586 miles (2½ per cent.); Russia, 575 miles (2½ per cent.); Great Britain and Ireland, 101 miles; Italy, 180 miles.

The United States has nearly four-fifths of the railroads in America; the United States and Canada together nearly six-sevenths of it; but in 1896 South America did more proportionally than North America in railroad building. Nearly half of the new South American railroad was in Brazil, and two-fifths of it in Chile, leaving but a trifle for all the other countries. Cuba, which we hear spoken of sometimes nowadays, has 1,076 miles of railroad, to which there have been no additions for many years.

Congress has finally agreed on a railroad employes' arbitration act, and it will doubtless become a law by the President's approval. We give an abstract of it in another column. As we have already said, we cannot see that an arbitration law is likely to be of any material advantage to anybody, but the passage of this bill is perhaps of some significance as a sign of the trend of public sentiment, and it contains two provisions which have nothing to do with arbitration; section 9, forbidding Receivers to reduce wages except on the order of the court after a hearing; and section 10, forbidding a railroad to require members of a Relief Fund to renounce their legal claim against the company for damages on account of an accident if they accept relief money from the Fund for such accident. This last is the same in purpose as the law recently passed in Iowa, and evidently is intended to nullify clauses in the contracts of the employees of the Pennsylvania, the Reading and the Burlington. The law as drawn, however, forbids contracts of the kind referred to, only when they are made because the employer requires them as a condition of employment; and as the roads named do not compel any employee to join the relief department we do not see how they can be held to have required the renunciation clause. The spirit of the law, however, is plain, and if it does not accomplish what it is intended to accomplish the labor organizations will no doubt get it amended. Section 10 also forbids blacklisting and prescribes a penalty for a railroad officer who requires an employee to promise not to belong to a labor organization, but these are unimportant, for no one tries to do these things. It remains to be seen whether any employer or body of employees will try to make use of the law. It says that disputes "may" be submitted to arbitrators, its framers being too discreet to try to insert the word "shall" at this point. But then it goes on with a page or two of shalls which have a formidable look, and almost convince the reader that compulsory arbitration of strikes will work; but these all depend on the preceding "may," after all. This being so, a number of interesting questions concerning the value of some of the mandatory clauses in settling disputes will probably remain unsettled for an indefinite time. The clumsy provisos in the first and third stipulations set forth in Section 3 completely nullify one of the mandatory clauses, and this alone is enough to show that the framers of the bill probably expect nothing more than a moral advantage from its passage.

Moral results being the basis on which this law is to be judged, it becomes simply a resolution of Congress; a declaration of the views of the Senators and Representatives; and what do we find? Chiefly that labor organizations are formally recognized. The railroad manager who has persistently declined to treat with his employees, except through one or more spokesmen selected from among themselves, finds that it is the sense of Congress that in this matter he is wrong. Some of the best managers have been and still are among those who rigidly adhere to this idea, and this law may disturb them somewhat, for it will tend to make the brotherhood leaders more strenuous in their efforts to get themselves recognized; but we are inclined to think that no great harm will be done. Employees have made woful mistakes in placing their fortunes in the hands of irresponsible "chiefs," and it has often been a mercy to them that managers have refused to treat with such spokesmen; but in principle every employee has the right, within reasonable bounds, to select his own attorney or counselor, and if the enjoyment of this right produces injurious results the injuries must be cured in some other way. Moreover, managers who have negotiated with level-headed leaders, like Mr. Arthur, testify that no harm has come from so doing. A tribute to Mr. Arthur's ability from Dr. Taussig, of St. Louis, was published in the Railroad Gazette last week. Section 9 of the new law, empowering employees to appear in court when a Receiver wishes to reduce their wages, allows them to speak "through the officers and representatives of their associations," so it is possible that the labor leaders may some day find an occasion to try their new privilege.

The American Railway Association.

The question whether members shall have the right to vote by proxy is likely to be a prominent subject of discussion at the next meeting of the American Railway Association. At the Louisville meeting Mr. Ashley, of the Ann Arbor Road, gave notice (after the lively discussion which we reported in our issue of May 6) that he should be on hand in October and move to amend Rule 24 so as to make it forbid proxy voting. This is a question of considerable consequence, the decision of which may radically affect the whole future of the Association

Doubtless President Myers, in ruling out proxies, acted exactly in accordance with the spirit of the rule and with the letter and spirit of the rules as a whole. The rule says that a road "may" be represented by the . . . general manager, etc., and that the highest official present "shall" cast the vote, etc. The action of the meeting in overruling the President (by a vote of 42 to 29) was largely due, very likely, to a feeling that depriving absentees of their votes was not fair play, but there is nothing in the rules to justify this view. It has long been the practice to accept the credentials of representatives who were not actually connected with the road for which they desired to act, as, for instance, the general manager of a neighboring road, but it appears that such representation has never before been challenged. The argument presented at Louisville that Rule 24 was designed simply to give certain officers a standing in the meetings without credentials, while, at the same time, leaving the way open for sending other persons with written autority, is weak, because it ignores the last clause of the rule—"the official present . . . shall cast the vote."

The substance of the argument in favor of proxy voting is that, without this privilege distant companies, a great many of which are always absent, are deprived of an essential right. This is a strong argument. In many matters on which votes could be taken it would be almost conclusive, and it is likely that the theory of allowing proxy voting will be strongly defended, when the question comes up, not only by those who believe it to their own present interest to make it easy for distant roads to vote, but also by others who will advocate it as a matter of abstract principle. But if the argument prevails it will sooner or later necessitate important changes in the constitution of the Association, and in any event there are strong arguments on the other side.

The principal objection to proxy voting, as an abstract proposition, is based on the belief that it will help to suppress discussion; that it will be a convenient device for members who may wish to "jam through" something. And yet, in the case which called out the discussion at Louisville, resulting in the demand for a change in the rule, it might plausibly be claimed that the proxy party was endeavoring to promote rather than suppress discussion. This shows how hard it is to make virtue automatic in a wicked world.

The Association has come to be essentially a professional body. Originally it was formed for the simple business purpose of co-ordinating time schedules of through trains; but when the members decided to take up the discussion of train rules, safety

appliances and other questions embodying many abstruse and difficult features, and often leading to discussions more or less academic in their nature, they changed the whole theory of the organization. This is clearly shown in the second of the "Rules of Order" which make up the constitution of the Association: "Its object shall be the development and solution of problems connected with railroad management in the mutual interest of the railroad companies of America." The older rule (Rule 3) that the action of the Association shall be recommendatory, and not binding on the members, is in consonance with this. In a truly professional association the pursuit of the truth must take rank before the pursuit of the merely expedient—and that has been the spirit in which the best work of the American Railway Association has been done. It is true that business conditions of an unyielding nature have prevented members from carrying out at home the ideas that they have favored in the Association, and have influenced votes in the wrong way; but this does not shake the integrity of Rule 2 or prevent the great body of the members from carrying on the Association in accordance with it. It is also true, as we have just suggested, that in the case of the question that started this controversy at Louisville it can be claimed that a vote in favor of proxy voting was a vote in favor of deliberation; but yet, to facilitate voting by absent members, without restriction, is to facilitate voting on questions without consideration, and the practice is so far bad.

There will be cause for regret if the present freedom of discussion is in any way abridged. The slow and cautious way in which the Standard Code of train rules was adopted by the Association illustrates the extreme delicacy with which every railroad officer feels compelled to handle nearly every question (of the kind that comes before an Association like this) when he is conscious that his decision, at every point, may affect important interests in a way more serious than it is possible to estimate beforehand. The affairs with which he deals are of such magnitude in themselves and are so interwoven with other matters that no one officer can decide them alone one time in a hundred. He does not like to vote in a meeting until after he has been home for consultation. And yet the best function of this Association, the one most useful in the past and offering the greatest promise for the future, is the opportunity for discussions by individual men. A subordinate officer, not entitled to a vote, may, on occasions, be more valuable to the membership as a whole, than the superior who casts his company's ballot. With the maintenance of the rule that a member's action in the Association shall not necessarily control his action at home, there is a fruitful field for the Association in the future, for there are no other meetings to which managing officers come prepared to discuss the questions which are peculiar to their own field. Insistence on the value of single votes, such as was manifested at Louisville, looks like an attempt to bind each voter to the record which his vote makes. It is true that, under Rule 3, any such attempt must be without effect, but, nevertheless, action of this kind must tend strongly to chill the spirit of freedom in discussion; and, as we have said, we believe this freedom to be essential to the prosperous life of the Association.

The reader unacquainted with the history of the Association may ask why, if a vote is not binding on any one, there should be a strenuous contest about admitting it. The answer is that the vote of this body has a very strong moral effect. It is evident that those who fought so actively at Louisville for the postponement of brake tests were actuated by the conviction that a test approved by the American Railway Association would have great weight, in the minds of well-informed judges, even if it had not a feather's weight legally. With the character of the work of the Association thus clearly exhibited, it is plain that every question brought before it should be deliberated upon with no repression of any interest. A decision which is to have weight among men by reason of its inherent justice or wisdom—as is the case with one which is only "recommendatory"—must show its wisdom and justice on its face. A vote by proxy on a question which has not been discussed in full meeting may be wise, or may be ill-advised, but no one can tell; and accepting the vote may be giving an advantage to the absent that is equivalent to suppression of the members present. On the other hand, it is easy, by suitable rules, to prevent any action by those present at any meeting which shall do injustice to those who are absent.

To maintain the Association as a forum for individuals does not necessarily forbid the use of its machinery for taking letter ballots or for taking votes by companies, even to the extent of taking binding votes, under suitable regulations, if such shall be found to be desirable. Letter ballots, restricted to their legitimate function of deciding questions that have been fully discussed, have been a great convenience in the American Society of Civil Engineers and the Master Car Builders' Association.* But if they were to be used much in the American Railway Association it would probably soon be found necessary to adopt, as the Master Car Builders have done, some basis of representation, by cars, or mileage or earnings, which would equalize the large and small companies. A change of basis would be equally necesary if proxy voting were to become common.

April Accidents.

Our record of train accidents in April, given in this number, includes 50 collisions, 68 derailments and 7 other accidents, a total of 125 accidents, in which 18 persons were killed and 48 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

COLLISIONS.	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	9	0	0	9
Misplaced switch	0	0	2	2
Failure to give or observe signal	2	0	1	3
Mistake in giving or understanding orders	0	5	0	5
Miscellaneous	4	4	6	14
Unexplained	2	4	11	17
Total	17	13	20	50

DERAILMENTS.

Broken rail	3	brake	1
Loose or spread rail	4	Misplaced switch	5
Defective bridge	1	Bad switching	1
Broken wheel	4	Open draw	1
Broken axle	3	Washout	2
Broken truck	2	Malicious obstruction	1
Fallen brakebeam	1	Unexplained	36
Failure of drawbar	3		68
Too quick application of air-			

OTHER ACCIDENTS.

Boiler explosion	0
Cylinder explosion	0
Broken side rod	0
Cars burned while running	5
Breakage of rolling stock	1
Other causes	1
	7
Total number of accidents	125

A general classification shows:

	Collisions.	Derailments.	Other accid's.	Total.	P. c.
Defects of road	0	8	0	8	7
Defects of equipment	9	14	1	24	19
Negligence in operating	24	7	5	36	29
Unforeseen obstructions	0	3	1	4	3
Unexplained	17	36	0	53	42
Total	50	68	7	125	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Passenger	15	10	6	31
Freight and other	70	58	1	129
Total	85	68	7	160

The casualties may be divided as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Killed:				
Employees	11	6	0	17
Passengers	0	0	0	0
Others	1	0	0	1
Total	12	6	0	18
Injured:				
Employees	12	10	1	23
Passengers	17	4	0	21
Others	1	3	0	4
Total	30	17	1	48

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road	0	1	3	5
Defects of equipment	0	0	0	1
Negligence in operating	0	17	11	13
Unforeseen obstructions and maliciousness	0	0	0	0
Unexplained	0	3	3	4
Total	0	21	17	23

Ten accidents caused the death of one or more persons each, and 20 caused injury but not death, leaving 95 (76 per cent. of the whole) which caused no personal injury deemed worthy of record.

*The Constitution of the Master Car Builders' Association, Article IX., prescribes detailed regulations for conducting letter ballots. Any proposition recommending the adoption of standards must be made in writing; the Association, after discussion, must decide by vote whether the proposition shall be submitted for decision by letter ballot, and if it decides in the affirmative the Secretary shall mail to members a copy of the proposed recommendation, with a report of the discussion thereon, which report must be approved by the Executive Committee. A two-thirds vote is required to carry any proposition by letter ballot. The by-law which regulates voting at meetings (VIII.), requires the votes of the majority of the members present to decide any question "unless otherwise provided." This proviso evidently allows for aditional votes by representative members controlling more than 1,000 cars each.

The comparison with April of the previous five years shows:

	1898.	1897.	1896.	1895.	1894.	1893.
Collisions	50	36	21	33	37	72
Derailments	68	63	72	75	62	92
Other accidents	7	6	1	9	5	9
Total accidents	125	105	94	117	104	173
Employees killed	17	16	22	17	17	33
Others killed	1	5	6	10	11	2
Employees injured	23	54	49	50	59	93
Others injured	25	36	55	40	29	29
Passenger trains involved	31	34	22	37	30	58
Average per day:						
Accidents	4.17	3.50	3.13	3.90	3.47	5.77
Killed	0.60	0.70	0.93	0.90	0.93	1.17
Injured	1.60	3.00	3.47	3.00	2.93	4.07
Average per accident:						
Killed	0.14	0.20	0.30	0.23	0.26	0.20
Injured	0.38	0.86	1.10	0.76	0.84	0.70

We find no record of any fatal accident to a passenger in April, and the number of employees killed was less than the average in the light months (April to August, inclusive) last year. The tramp victims were scarce last month, so that the total killed, all classes, was low. The average per day (0.6) is lower than any for the past five years, except the following: November, 1896, 0.47; February, 1894, 0.54. The last preceding month (March, 1898), the average was 0.61, and in February, 1895, it was 0.64. But April had no lack of serious accidents. One of the most disastrous was that at Marias, Mont., on the 7th, where a freight train was destroyed by a dynamite explosion and the fire which followed. Another accident, which involved no passenger train, and, in fact, caused no harm to life or limb, but which is of interest from an operating standpoint, was that at Hopewell Junction, N. Y., on the 5th, where the failure of a drawbar caused the destruction of a bridge.

Superintendents who believe in the use of the space interval on single track roads will find in the present account four collisions which may be used as arguments in support of their view. Two of these—that at Coffeyton, Mo., on the 13th, and that at Libertyville, Ia., on the 16th—killed three persons each. The third was at Fond du Lac, Wis., and the fourth was at Edwardsville, Ill., on the same day that the Coffeyton collision occurred. The cause in the first three cases appears to have been plain, unrelieved forgetfulness; at Edwardsville the engineman's watch was slow. Whether or not the conductor had a watch, or used it if he had one, are points on which we are not informed.

At Fairport, N. Y., on the 21st., there was a collision, killing one employee, injuring two others, and destroying several thousand dollars' worth of property, which seems to have occurred in spite of the block system. The signals were properly managed, but the engineman had fallen asleep. To keep the discipline at that high standard where a runner will not neglect to take proper rest is exceedingly difficult, for the love of big figures on the payroll will lead many men to take risks in various ways which no inspection can detect. To apply an automatic stopping device to every signal is also a difficult problem, for it would require a large expenditure as well as elaborate inspection. The reader may perhaps recall the rule in the code of a Southern railroad, which we published a few weeks ago, requiring locomotive firemen to see that enginemen do not sleep while the engine is in motion. We might perhaps recommend the application of this rule to prevent collisions like that at Fairport; but some superintendents would probably insist that we should recommend a third man to keep watch of the fireman. Moreover, a fireman may be wideawake, but still disinclined to ruffle the temper of the runner. He is likely to think it better to himself keep watch ahead.

The stalling of a freight train in a tunnel near Roanoke, Va., on April 18 resulted in the death of the engineman, who, with the fireman, the conductor and one brakeman, was overcome by gas and carried out in an insensible condition. On the night of the 30th, near New Market, Ont., four persons in a carriage, driving across a track, were struck by a locomotive and killed.

We have found reports in April of only five street car accidents, in which 13 persons were injured. Three of the accidents were collisions at crossings or junctions, and one was a runaway, due to the failure of a brake chain.

The Brotherhood of Locomotive Engineers, now holding its general convention at St. Louis, has once more rejected a resolution providing for federation with other railroad brotherhoods. The resolution which was offered this year was very cautiously worded, being so drawn as to enable the engineers to easily keep out of any undesirable entanglement with any other body; but according to the constitution, it could be adopted only by a two-thirds vote, and this it failed to receive, the vote standing 290 to 205. This would seem to indicate that Mr. Arthur and his conservative supporters still retain their influence practically unimpaired. The proposal to federate stipulated, in substance, as follows: The chief of each of the five national railroad labor organizations shall constitute an executive committee. This committee will not be called upon to act until the local or system federation committee on the railroad on which trouble exists reports that it is unable to honorably adjust the differences. The national federation ex-

ecutive committee would then be called upon to investigate. This committee would not have power to order a strike. Its duty would simply be to investigate and to decide whether a strike would be justified, and its vote would have to be unanimous. In case the entire committee agreed that drastic measures were justifiable, they would have only the power to so report, and each separate organization would then vote by itself. On the votes being taken, two-thirds of the membership of each of the five organizations would have to vote for the strike before it could be ordered. The rejection of so moderate a demand from the federationists would seem to indicate that the conservatives are both vigilant and thoughtful. A St. Louis correspondent says that this majority vote in favor of the federation proposal gives its promoters the right to have it voted on by all the local divisions.

Ton-Mile Basis for Engine Service Statistics.

(*Continued from page 375.*)

coal, and increase the cost of coal per mile, other conditions remaining the same. As a result, there is a strong temptation for enginemen and master mechanics, and possibly others, to so handle matters that their records will show at least as well as in the past. In other words, the engine-mile basis presents seemingly good arguments for light loading and inefficient work. I believe I am not far from the truth in saying that the foregoing tables and discussion warrant the statement that the use of the engine mile as a basis of fuel comparison naturally, and almost inevitably, leads to erroneous conclusions, and has a strong tendency to foster uneconomical methods of operating, while statistics based on the ton-mile are much less liable to mislead, and encourage economy.

Repairs.—It would seem that the same line of reasoning which has been applied in comparing the merits of the engine-mile and ton-mile in the case of fuel, should have equal force when considering the proper basis with which to determine the cost of locomotive repairs, and lead to the same conclusion.

Attention is invited to Table 3, in which is made a comparison of the cost of engine repairs on engine-mile and ton-mile basis:

TABLE 3.

March,	1896.	1897.	Increase, Per cent.	Decrease, Per cent.
Average miles per engine..	2,282	2,289	3-10	
Average ton-miles per engine	782,213	972,486	24	
Repairs per engine mile....	4.48	5.25	17	
Repairs per 1,000 ton-miles	13.90	13.78		1

The fact that, while the average number of miles per engine was the same for both years, the work done per engine, as measured by the average ton-miles, was 24 per cent. greater in 1897, will account for the fact that the cost of repairs per mile run was 17 per cent. greater in 1897. Had there been no ton-mile statistics, it would have been exceedingly difficult to have escaped drawing the conclusion that the cost of repairs showed an unwarranted increase in 1897, because, with practically the same average mileage in both years, the cost per mile increased 17 per cent. But when the cost is compared with the work done, as measured by the ton-mile, we discover that the cost of repairs was slightly reduced in the latter year.

Wages.—At first sight it would appear that there is no good reason of determining the cost of wages on the ton-mile basis, but I believe further consideration will show the contrary. As the cost of wages is now shown, so much per mile, there is no inducement to reduce the cost of this item per ton-mile of freight, because the item of wages, on the mile basis, will be the same on a division which may average five cars per train as on one where the average is five times this. On the other hand, if the wages are compared on the ton-mile basis, it is evident there is a strong inducement to reduce the cost of wages per ton by increasing the tonnage hauled.

Other Items.—If the arguments presented are considered sound, it would seem to be wise to use the ton-mile as the unit of comparison for fuel, repairs and wages, or over 95 per cent. of the total cost of locomotive service. With this large percentage on the ton-mile basis, it would seem proper to use it as the basis for the total cost and all the items. The fact that a railroad has ton-miles to sell, and not engine-miles, seems to me sufficient reason for keeping the cost of locomotive service on the same basis, so that a direct comparison of the selling and cost prices of their commodity can easily be made. It should not be inferred from this that I would advocate doing away with a statement on the engine-mile basis, showing the oil records made by individual engineers, for I believe this important.

Tables 4 and 5 afford an opportunity for comparing all the items making up the total cost of engine service on both the engine-mile and ton-mile basis, for the month of March, 1896 and 1897:

TABLE 4.

Cost of Engine Service in Cents Per Mile.

	1896.	1897.	Increase, Percent.	Decrease, Percent.
Miscellaneous and small stores	.63	.68	8	
Oil, tallow and waste	.21	.27	29	
Fuel	6.82	7.34	8	
Wages	7.37	6.92		9
Repairs	4.48	5.25	17	
Totals	19.51	20.46	5	
Average miles per engine	2,282	2,289	1-10	

TABLE 5.

Cost of Engine Service in Cents Per 100 Ton-Miles.

	1896.	1897.	Increase, Percent.	Decrease, Percent.
Miscellaneous and small stores	1.90	1.79		6
Oil, tallow and waste	.63	.67	6	
Fuel	21.33	19.50		8
Wages	22.63	17.71		22
Repairs	13.90	13.78		1
Totals	60.39	53.45		12
Average ton-miles per engine	782,213	972,486	24	

Comparison of Records.—There are so many varying conditions, as quality of coal, business to be done, average speeds, grades, water and types of engines, that the records made by different divisions of even the same system cannot with justice be compared except in the most general way. If this is a just conclusion as applied to divisions, it will apply with greater force to different systems, especially when the different methods of accounting are considered. Aside from the justice in the case, I believe it an unwise policy to rely to any considerable extent on a comparison of the records made by different divisions on the same system, or of one system with another, with a view to improving them or reducing expenses. I am fully persuaded that it is not only more just, but a better policy, and will secure much better results, to compare the records of each division or system with those made by the same division or system during the same period in the year previous.

Conclusion.—For the past few years expenses have been met and interest earned by close economics in operating expenses, and it is more than probable that the profits of the future will be derived from the same source. When we consider these facts and realize that from 35 to 40 per cent. of total operating expenses are incurred by the motive power department, we will estimate at its proper value the prime importance of having motive power statistics on a basis which at the same time compares the cost with the work done and encourages economical methods of operating rather than the reverse.

Mr. F. A. Delano, Superintendent of Terminals, Chicago, Burlington & Quincy: Mr. Quereau shows very clearly in his paper the advantage in the use of the ton mile as a basis for locomotive performance statistics, as compared with the train mile. Without wishing in any way to detract from the force of his arguments, it might be perfectly pertinent to observe that the ton-mile basis is still very far from an ideal one, and, when it is compared with the car-mile basis, the advantages are certainly not entirely obvious. Indeed, one prominent trunk line east of Chicago has discarded the ton-mile basis for rating trains, finding the car-mile basis, on the whole, more accurate. May it not be well, therefore, to consider fully the objections to the ton-mile basis, even though it may be the most nearly accurate unit, in the hope that some age more advanced than ours may devise a more complete, yet practical, way of measuring locomotive performance.

On comparatively level roads, where the ruling gradients do not exceed .7 of one per cent., the important factors in train resistance are wind, or atmospheric resistance, rolling friction, journal friction, and curve resistance. On roads, however, where grades are continuous (not simply occasional), and where the ruling gradients exceed .7 of one per cent., or thereabouts, the factors of train resistance just mentioned sink into insignificance when compared with grade resistance, and, of course, more and more so as the rate of grade increases. In the first case the number of cars, the number of wheels, and the length of train are important factors, while in the second case the number of tons is the important factor.

Another troublesome feature of the problem, which cannot be ignored, is the fact that the grade resistance is the only factor in train resistance which we can accurately determine from the data in our possession. All experiments indicate that the other factors are exceedingly variable, and that much experimental work is yet needed to give us data on which to base our conclusions. It was hoped by those who advocated the ton mile as a basis of calculation, that it would enable a comparison of statistics of one division with those on another, but it is evident that even Mr. Quereau does not think that this will be possible, except in a very limited way. The result of some tests in train resistance which once came to the writer's attention, indicated that a train of empty cars which a locomotive could haul up a 1 per cent. grade, were more than the same locomotive could haul continuously at the rate of 25 miles an hour on a level track.

This fact indicates that the total train resistance in pulling a long train at considerable speed on a level track may amount to as much as the total resistance in pulling the same train at slow speed up a considerable grade. It may be observed that the inability of the locomotive to pull the train on a level is, in part, at least, due to a deficient boiler capacity. It would also seem to point to the fact that occasional grades, even of considerable severity, do not necessarily limit the length of trains which can be successfully handled. It cannot longer be said that on a level road an engine may pull as many cars as it can start, but, perhaps by the use of larger boilers and the compounding principle, we may be able to do so in the future.

The Railroads of the World at the End of 1896.

We publish this week our usual translation of the railroad statistics for the world which are compiled every year by the "Archiv für Eisenbahnwesen." The original figures are given in metric units, and we have had to convert them to English units. Great care has been taken in this conversion, and it is believed that it has been made without error; but we fear that there are some errors in the original. The original table, for instance, gives the miles of railroad in British India as 19,407 (31,232 kilometers), and the increase from 1895 six kilometers. The mileage open December 31, 1896, was 20,173, and we have put in that figure. The gain in miles worked was 707 miles from 1895 to 1896. We retain the "Archiv's" form of giving length of railroad relatively to population and to area, beause that form has been adopted by the Statistician of the Interstate Commerce Commission and for purposes of comparison it is desirable to have uniformity. It would be more logical and perhaps carry the idea more directly to give these figures in population per mile of railroad and square miles of territory per mile of railroad, but the principal thing is to have comparable figures.

It is not necessary to say much about these statistics, but one could draw from them many speculations and conclusions. It will be observed that the rate of increase in the United States has fallen materially. From 1892 to 1896 our rate of increase was only 4.5 per cent.; in Great Britain and Ireland it was 4.6 per cent., but in none of the other great countries was it nearly so small. In 1892 we had 43 per cent. of the total railroad mileage of the world, and at the end of 1896 we had but 41 per cent. Relatively to population, however, we are better supplied than any of the other great nations. Taking those countries which have 20,000 miles or more, we stand first in miles of railroad relatively to population, and British North America comes next. Then follow in their order France, Germany, Great Britain and Ireland, Austria-Hungary, Russia and British India, in which latter country the supply of railroads per inhabitant is very small indeed. Much the greatest quantity of railroad relatively to population is found in the Australian colonies. In West Australia, for instance, there are 115 miles for each 10,000 inhabitants, while in the United States there are 26 miles and in the United Kingdom 5.2. Obviously, however, this comparison is not worth much, because in Australia the total railroad mileage is very small and the area very great. In West Australia, for instance, the miles per 100 square miles are so few that they do not find a place even in the first decimal.

Railroads of the World at the End of 1896.

Country—	Length of railroad, miles.	Per ct. increase 1892 to 1886.	Miles per 100 sq. miles area.	Miles per 10,000 of population.
All of Germany	29,422	7.1	14.	5.59
Austro-Hungary (including Bosnia, etc.)	19,997	13.9	7.56	4.42
Great Britain and Ireland	21,265	4.6	17.4	5.22
France	25,585	7.1	12.2	6.58
Russia (including Finland)	24,012	22.1	1.13	2.24
Italy	9,599	12.9	8.54	3.04
Belgium	3,590	8.2	31.4	5.53
Netherlands (including Luxemburg)	1,944	1.6	14.	3.72
Switzerland	2,214	6.3	13.85	7.26
Spain	7,632	12.9	3.7	4.16
Portugal	1,465	1.9	4.03	2.85
Denmark	1,435	10.5	9.33	6.21
Norway	1,204	24.1	.80	5.65
Sweden	6,149	16.8	3.39	12.35
Servia	354	5.5	1.77	1.49
Roumania	1,789	15.5	2.74	2.93
Greece	592	4.	2.25	2.36
European Turkey, Bulgaria and Roumelia	1,510	34.	1.29	1.55
Malta, Jersey, Man	68	...	16.1	2.11
Total, Europe	159,824			
United States	182,746	4.5	6.1	25.97
British North America and Newfoundland	16,737	...	1.45	44.55
Mexico	7,388	7.3	.97	5.84
Central America	621	...	.32	1.80
Total, North America	207,493			
United States of Colombia	346	32.6	0.0	.74
Cuba	1,076	...	2.42	6.58
Venezuela	634	27.5	.16	2.73
San Domingo	117	63.4	.48	2.30
Brazil	8,092	13.4	.16	4.72
Argentine	8,937	10.6	.64	19.63
Paraguay	157	....	.16	3.10
Uruguay	1,119	5.9	1.61	13.61
Chile	2,505	30.0	.81	7.83
Peru	1,036	....	.16	3.42
Bolivia	621	8.8	0.0	2.55
Ecuador	186	....	1.61	1.24
British Guiana	22	....	0.0	.81
Jamaica, Barbadoes, Trinidad, Martinique and Porto Rico	522	57.7	....	....
Total South America	25,370			
British India	20,173	9.6	.81	.61
Ceylon	297	56.6	1.13	.87
Asia Minor and Syria	1,559	57.3	.16	.99
Russia (Transcaspian Dist.)	940	5.7	.32	13.42
Siberia	1,888	....	0.0	3.29
Persia	34	....	0.0	0.0
Dutch India	1,293	21.3	.48	.43
Japan	2,290	22.0	1.29	.50
Portuguese India	51	....	3.54	.87
Malay States	161	85.0	.48	2.24
China	269	117.0	....	....
Siam	89	....	....	....
Cochin China, Pondicherry, Malacca and Tonquin	231	71.5	....	....
Total Asia	29,275			
Egypt	1,446	44.3	.322	1.49
Algiers and Tunis	2,560	28.9	.644	4.29
Cape Colony	2,500	2.5	.805	14.23
Natal	402	....	2.41	7.46
South African Republic	627	222.	4.83	7.39
Orange Free State	621	11.1	1.13	29.58
Mauritius, Reunion, Senegal, Angola, Mozambique, Kongo	1,044	55.5	....	....
Total Africa	9,200			
Australia	13,902	9.6	.32	31.62
Recapitulation:				
Europe	159,824	....	....	....
North America	207,493	....	....	....
South America	25,370	....	....	....
Asia	29,275	....	....	....
Africa	9,200	....	....	....
Australia	13,902	....	....	....
Total	445,064	....	....	....
Per cent. increase over 1895	2.4			

TECHNICAL.

Manufacturing and Business.

Hancock locomotive inspirators, made by the Hancock Inspirator Co., Boston, Mass., are being applied to one engine for the Tionesta Valley, and eight for the Pecos Valley & Northeastern, now being built by the Brooks Locomotive Works.

The Woods Car Seat & Mfg. Co. has been incorporated in Illinois, with a capital stock of $100,000, by Waldo F. Tobey, Ernst L. Wilson and Buell McKeever.

The New Jersey & Pennsylvania Concentrating Works, Orange, N. J., are in the market for 25 36-in. gage heavy standard car trucks, complete with brake.

The Westinghouse Electric & Mfg. Co. will shortly build an addition to its plant at East Pittsburgh.

At the annual meeting of the Kansas City Car & Foundry Co., Kansas City, Mo., the old Board of Directors was chosen to serve another year. The following officers were elected: President, K. B. Armour; Vice-President, L. E. Janes; Secretary and Treasurer, Robert Moody.

The Plant of the Memphis Car & Foundry Co. has been sold to C. J. Wagner for $11,000.

Monarch brake beams, made by the Monarch Brake Beam Co., Ltd., Detroit, Mich., will be applied to 500 coal cars for the Illinois Central, instead of 50, as stated last week.

In February, March and April the Clayton Air Compressor Works, Havemeyer Bldg., New York, sent out a large number of compressors. The following partial list will give an idea of the large variety of work to which they will be applied: In all nineteen air compressors were sold for operating pneumatic stone tools, chipping and calking tools, air hoists, etc.; nine compressors for moving and elevating acid and chemical solutions; four air lift pumping plants were installed and placed in operation; three were furnished to rubber works for removing hose from mandrels, testing hose and inflating tires; one was supplied for the pneumatic transmission of messages; two for oil burning plants; three for racking off beer in breweries, and one for spraying brick in the process of manufacture. In addition to this number four were exported to Europe for working pneumatic shop plants. Among the orders of especial interest included in the above summary may be mentioned the plant put in at the navy yard, Brooklyn, to supply power for pneumatic drills, paint machines and hammers, and one sent to the Yarrow ship yard, London, for working pneumatic tools. Another installation of interest is the compressor at the Dunn Building, New York, which supplies compressed air dusting nozzles for cleaning the iron grill work of the elevator shafts. Among the orders now in hand is a large compressor for the Bath Iron Works, Bath, Me., to drive pneumatic tools.

Iron and Steel.

An order has been posted in all departments of the shops of the Philadelphia & Reading Coal & Iron Co. at Pottsville, Pa., notifying the men that the shops will work only four days a week, until further notice. This affects 700 men, who have been working full time for over a year.

Bids were opened May 24 for supplying the armor for the battle-ships Illinois, Alabama and Wisconsin, now being built. For the Illinois, the Bethlehem Iron Co. and the Carnegie Steel Co., Ltd., both bid, one taking the lighter armor and the other the heavier. For the Alabama, the Bethlehem Iron Company bid $1,022,504, and for the Wisconsin, the Carnegie company bid $1,023,504. The rate in each case was $400 per ton flat, for bolts and armor, the maximum allowed by Congress.

The Interstate Malleable Iron & Machine Works have leased the Iron Bay Foundry at Duluth, Minn., and will put it in operation as soon as it can be overhauled. They will manufacture car couplers, steam traction engines and general malleable and repair work.

The property of the Plano Steel Co., Plano, Ill., of which Frank H. Lord is Receiver, and which consists of rolling mill, machine shop and iron foundry, will be offered for sale on June 16, at 10 a. m., to the highest bidder.

The Lehigh Zinc & Iron Co., which has plants at Jersey City, South Bethlehem, Florence and Joliet, has purchased 100 acres of land near Lehigh Gap, Pa. The company will remove all its plants to that place within the next two years.

New Stations and Shops.

Contracts for the new Union station to be built at Des Moines, Ia., have been let as follows: Facing brick, the La Salle Brick Co.; building brick, Des Moines Brick Co., and the foundation, Capitol City Brick Co.

The contract for building the new freight house for the Erie Railroad at Buffalo has been awarded to Grattan & Jennings of that city. This company also secured the contract for elevating the tracks of the Erie Railroad in Jersey City.

The Eastern Minnesota will build a storehouse at West Superior.

The Grand Trunk Railway system has received a tender from the City Council of Montreal, Canada, for a site for a general office building. We are officially informed that they will probably accept the tender, and, as soon as the legal features of the matter are concluded, proceed to build a suitable office building.

Electric Lighting in Chicago.

The Chicago Edison Co. has secured control of the electric plants of the Calumet Gas Co., the old Englewood Electric Light Co., the Hyde Park Electric Light & Power Co. and the old Hyde Park Thomson-Houston Co. It is said that the amount involved in the transaction is about $1,100,000. The combined companies are to be operated under the Commonwealth franchise, owned by the Edison Co. Only the electric portion of the Calumet Gas Co.'s business is included in the plan. The absorption of these plants gives the Edison Co. the practical control of electric lighting on the South Side, although it is expected that the distribution of territory among the companies will remain the same as heretofore.

Rails for China.

Consul Ragsdale, of Tientsin, under date of March 26, incloses a dispatch inviting tenders for the supply of 7,000 tons of steel rails; also blanks for proposals. It will be impossible, says the Consul, for United States firms to enter proposals in time, but he has reason to believe that bids by cable will be considered.

The directorate invite tenders for the supply of 7,000 tons of steel "Sandberg"-type rails of 60 lbs. per English yard, and fastenings in addition. Bids must be sent in not later than 10 a. m. on May 20, 1898 (extended to May 31 by order of March 28). Quotations must be in Hong-ping taels, and should include freight, insurance, and all other charges (except import duties) laid down on the Tongku wharf. The Hong-ping tael is not mentioned in the United States Treasury list of valuations of foreign currencies. The estimates of value of the tael in the various ports of China, on April 1, 1898, ranged from 60.4 cents (Shanghai) to 66.6 cents (Takao). The Tientsin tael was valued at 64.1 cents; the haikwan (customs) tael at 57.3 cents.

The following is from Mr. C. W. Kinder's (Eng. in Chief) specifications:—

Type.—The rails must be of new 1894 design of C. P. Sandberg, who will give specifications, templates, and watch manufacture, whether in Europe or America. Weight of rail, 60 lbs. per yard.

Quantities.—Rails, 7,000 tons; fish plates as needed, plus 5 per cent.; bolts as needed, plus 10 per cent.; spikes, 165 tons.

Length, 30 ft.; the proper percentage of short rails to be decided by C. P. Sandberg.

Each rail must bear the name of maker and date of manufacture in letters at least 1 in. high.

The rails must be of the very best quality, and must be made either by the Bessemer or Siemens acid process (on no account will basic steel be accepted); without being brittle, they must be hard and most durable.

The rails will not be accepted in China unless each is stamped with inspector's mark, and a proper certificate is produced from Mr. Sandberg stating number and nature of tests, together with accurate analysis of metal. The cost of inspection will be paid by directors. All bent or injured rails will be rejected on landing or purchased at reduced price fixed by District Engineer at Tongku. All rails unaccompanied by a proper proportion of fastenings will be held as rails not delivered.

A fine of 15 tael cents per ton shall be paid by contractors for each day any rails remain undelivered.

The rails must be landed on Tongku wharf not later than Nov. 15, 1898. The contractors shall land rails, etc., at their own risk and cost.

Payments will be made ten days after acceptance.

International Congress on Navigation.

The seventh International Congress on Navigation will be held in Brussels, July 25 to 30, under the patronage of the King of Belgium. The Secretary has issued a list of subjects and the names of the reporters, and instructions for joining the congress, the fee for which is 25 francs. The General Secretary is A. Dufourny, who may be addressed 38 Rue de Louvain, Brussels, Belgium. A very important list of reports is issued. Excursions will be made to various seaports now in course of building, and to the harbor works of Antwerp and Liege, and to the John Cockerill Works at Seraing.

A Testing Boiler in Locomotive Erecting Shops.

There has just been erected in the Mount Clare shops of the Baltimore & Ohio a high-pressure boiler for testing locomotive boilers under steam pressure. Heretofore a locomotive had to be hauled outside and fired up. Under the new arrangement testing is done in the shop, steam pipes having been arranged so that the engines on any track in the erecting shop can be tested.

Battleships for Russia.

Charles H. Cramp, President of the William Cramp & Son's Ship & Engine Building Co., has arrived here from Russia, where he secured a contract to build for the Russian Government one battleship and one cruiser. Both will be large vessels, the battleship of about 12,500 tons, with a speed of 18 knots an hour, and the cruiser of about 6,000 tons, with a speed of 23 knots an hour. They will be built according to designs of the company, which will begin work on both vessels immediately, as the contracts call for the delivery of the cruiser in 20 months and the battleship in 30 months. When finished the battleship will be provided with four 12-in. guns and four rapid firing 6-in. guns. The cruiser will have 12 6-in. guns.

Test of Electric Power Plant.

The mechanical engineering department of the Massachusetts Institute of Technology of Boston recently made a very complete test of the new electric power plant of the Boston Elevated Railroad (formerly the West End) at Harvard Square, Cambridge. The following account of the test has been sent to us:

The test was 48 hours long, and was divided into four shifts of 12 hours each. Among the results obtained are the evaporation of the boilers per pound of coal, the steam per horse power per hour used by the engines, the coal per electric horse power output per hour and the condensing water required for the horse power. This plant represents the latest development of electric power work. There are three E. P. Allis compound engines of about 1,800 H. P. each and three batteries of boilers. The gases from the boilers pass through an economizer on the way to the stack. The Babcock & Wilcox boilers are fed by power pumps drivin by electric motors. The steam piping is similar to that at Sullivan Square station, the steam being brought to the high-pressure cylinder through a separator, and the piping being beneath the engine, and arranged so that either cylinder may be run at high pressure. The air pumps are of the Allis jet condensing type run by a separate engine.

This test was made as complete as possible. A weir was built to measure the condensing water discharged from the jet condensers into the river. It was about 3 ft. wide, and at times had about a foot of water flowing over it.

This test has been of immense value to the students, as it gives them an opportunity to apply on a large scale the principles they have already learned in the laboratory. A large amount of useful data is also obtained, both for the road and for the students.

The Cramp-Vickers Ship Building Combination.

For several days a story has been going about to the effect that an agreement has been reached between the William Cramp & Sons Ship & Engine Building Co. and the firm of Vickers' Sons & Maxim, of Barrow-in-Furness, England. In the newspapers of Wednesday morning Mr. Charles H. Cramp, President of the Cramp Company, denied that any such combination had been brought about, but nevertheless we have very excellent reasons to believe that it has been accomplished. The capital stock of the Cramp Company will probably be increased from $5,000,000 to $12,000,000, and the facilities of the yards may be somewhat enlarged. Several strong banking houses and capitalists on both sides of the water are said to be interested. The theory of the new organization is to build ships for the world, including warships, and to build warships on speculation if contracts are slack. There have been several times in the last few years when warships could be sold at a great profit, and the gentlemen who have been negotiating this combination do not believe that the millennium is yet in sight.

Car Wheel Tests.

We have received from the New York Car Wheel Works a pamphlet giving an account of certain recent tests of special wheels and of axles. These are the tests made Jan. 21 under the supervision of a committee of the Central Railway Club, and were made by the New York Car Wheel Works and the P. H. Griffin Machine Works. Chilled wheels of special quality were submitted to the tests required in Europe for steel and steel-tired wheels, as well as to the Master Car Builders' tests. The continental test is very severe and the report shows remarkable endurance. We would advise those interested to send to the New York Car Wheel Works and get a copy of the pamphlet.

American Rails for Russia.

The British steamer Dulwich sailed from Sparrows Point, Md., May 21, for Vladivostock, Russia, with a consignment of 4,700 tons of rails. It was the first shipment of the order for 40,000 tons placed with the Maryland Steel Co. by the Russian Government for the Trans-Siberian Railroad a few weeks ago. The steamer Cabral will take a second cargo for the same port. Both vessels will go by way of the Mediterranean and the Suez Canal.

THE SCRAP HEAP.

Notes.

The city of Philadelphia has sold to a New York firm $900,000 of the bonds authorized by the city to pay for the Philadelphia & Reading subway in Pennsylvania avenue. The rate of interest on these bonds is 3½ per cent. and the price paid was 1.0327.

The Santa Fe Pacific will on June 1 adopt Pacific standard time on that part of its line west of Seligman. This is the Arizona division, 390 miles long. Heretofore Mountain time has been used throughout the whole line, from Albuquerque to Mojave, 813 miles.

The southbound train of the Atchison, Topeka & Santa Fe was stopped at Belen, N. M., on May 24, by two masked men, and the Wells-Fargo safe in the express car was removed from the car, blown open with dynamite and looted. It is said that the robbers secured about $7,000.

The State Railroad Commissioners of South Dakota have abandoned their defense of the injunction suit brought by the railroads to stop the enforcement of the tariffs prepared by the Commission, and in their formal amended answer explicitly say that the rates in their tariff are unreasonably low.

The manager of the lines of the Canadian Pacific east of Fort Williams has issued a circular prescribing regulations for receiving cars of other roads to be run in the passenger trains of the Canadian Pacific; and in addition to the usual conditions, makes the requirement that such cars must have steel tired wheels; and in cold weather they must have apparatus for heating by steam.

A colored freight brakeman of the Illinois Central was lynched at Rives, Tenn., last Sunday night. His

name was Joe Mitchell. The night before he had shoved a white boy tramp off a moving train at Rives, and the boy fell on the track, having his legs cut off at the knees. He lived long enough to tell who pushed him off. Mitchell was arrested, and while being held at the station to be taken to jail at Union City, a crowd gathered and hanged him.

The Grand Trunk has issued an order requiring all employees connected with train-working to have their watches inspected, and has appointed Prof. C. H. McLeod of McGill University, Montreal, Chief Watch Inspector. Watches must be inspected every three months and must, if possible, be rated every week. Employees buying new watches from the official inspectors may pay for them by installments, through the paymaster; but under this regulation the total amount must not be more than $20 and the total number of installments not more than four.

The Supreme Court of Minnesota has sustained the Anderson railroad land tax bill, which was passed by the Legislature in 1895, after several ineffectual attempts, and has been litigated in the courts ever since. It is said that about 2,500,000 acres of land belonging to the Northern Pacific, the Great Northern, the St. Paul & Duluth, and the Wisconsin, Minnesota & Pacific, may now be assessed as a result of this decision; but the railroads probably will appeal to the United States Supreme Court.

The President has approved the Alaskan homestead and right of way act. This law extends the homestead land laws to the district of Alaska and gives right of way through Government lands in that district to railroad companies organized under federal or State laws. If a railroad line is to be built over private lands the location will be subject to the terms of the Pacific Railroad acts of 1862 and 1864. The permanent location must be filed within one year after the filing of the preliminary actual survey. If any section of road is not completed within three years the right of way is forfeited. The law has a provision prohibiting exclusive occupation by a railroad of a right of way through narrow cañons or passes.

Destructive cyclones occurred in several places in the Western States last week, dozens of persons being killed. At Pennington, Wis., where 50 or more persons were injured, most of them railroad employees or members of their families, and where a roadmaster and a section foreman were killed, the Minneapolis, St. Paul & Sault Ste. Marie Railroad suffered a considerable loss of property. Press reports say that "Pennington is literally wiped off the earth." Among the buildings destroyed were the railroad station, a two-story hotel and a roundhouse in which were five locomotives. A large number of loaded freight cars were demolished. Pine forests were blown down and in many places heavy trees fell across the railroad tracks. On the 18th a passenger train of the Chicago, Milwaukee & St. Paul was reported as blown off the track at Preston, Ia.

Prescriptions for Using Oil.

The "Railway and Shipping World" (Toronto) says that the following rules are in effect on the Canadian Pacific:

"Enginemen will be expected, by carrying out the instructions which have been given as to the use of lubricating oils and by the exercise of care and good judgment, to achieve the following results:

"Eight-wheel Engines, Except Moguls.—Road, valve per 140 miles run, 1 pint; engine, per 40 miles run, 1 pint. Ballast, per 10 hours: valve, 1 pint; engine, 3 pints. Other work, per 10 hours: valve, ¾ pint; engine, 2½ pints. Switching, per 12 hours: valve, ¾ pint; engine, 1½ pint.

"Ten-wheel and Mogul Engines.—Road, valve per 120 miles run, 1 pint; engine per 35 miles run, 1 pint. Ballast, per 10 hours: valve, 1¼ pint; engine, 4 pints. Other works, per 10 hours: valve, 1 pint; engine, 3 pints. Switching, per 12 hours: valve, 1 pint; engine, 2 pints."

Chicago Street Railroad Franchise.

At Chicago a committee of citizens has been selected, composed of representatives of the bankers, the Municipal Voters' League, the Real Estate Board, the merchants, the City Council, the bar and the labor unions, to investigate the question of compensation to the city for street railroad franchise extensions. The committee met for organization May 17. Charles T. Yerkes and M. K. Bowen, representing the street railroads, being present by invitation. A subcommittee considered a list of suggestions made by John A. King. His plan includes a thorough examination of the situation to ascertain the amount of money invested in each line, what lines are paying and which are not, the amount of stocks and bonds issued and the cost of operating the roads. Also, the employment of three experts, one for each of the street railroad lines.

University of Illinois.

The public exercises of the twenty-seventh annual commencement of the University of Illinois, Champaign, Ill., began May 23 with the drill for the Hazleton prize, and a competitive drill on May 24. On May 26 President Draper gave a reception to the senior class, and the annual dinner of the University Club was set for May 27, the address being made by Prof. Henry S. Carhart, LL. D., of the University of Michigan. The programme includes the usual literary exercises and concerts, closing with the baccalaureate address by President Draper on June 5, Class Day June 6, Alumni Day June 7, and Commencement June 8.

Award of the Bessemer Gold Medal.

A report of the general meeting of the Iron and Steel Institute makes the interesting announcement that the Bessemer gold medal has been awarded to Mr. Richard Price-Williams in recognition of the active part he took in the introduction of steel for railroads. This award was made not only at the suggestion of the Council, but also at the request of Sir Henry Bessemer on his death bed. In presenting the medal the services of Mr. Price-Williams were reviewed briefly, in which his work in advocating the use of steel was brought out prominently. Mr. Bessemer appointed Mr. Price-Williams manager of the first Bessemer steel works, and his courage in supporting the claims of the Bessemer steel in face of much opposition gave him a strong claim in the consideration of the Council as worthy of the award.

Chicago Public Works.

A committee of five aldermen was appointed on May 9 by Mayor Harrison, of Chicago, to confer with the County Board in reference to the erection of a new city hall for Chicago.

A committee was also appointed by the Mayor on the same date to make plans for legislative action toward the municipal ownership of gas and electric light plants. This committee will work during the summer.

LOCOMOTIVE BUILDING.

The Fitchburg will buy two new 10-wheel locomotives.

The Missouri Pacific has just finished building one passenger locomotive at its own shops.

The Baldwin Locomotive Works have received an order to build 10 locomotives for New Zealand.

The Pittsburgh Locomotive & Car Works are building two locomotives for the Cleveland Terminal & Valley.

The Buffalo, Rochester & Pittsburgh has placed an order with the Brooks Locomotive Works for five engines.

The St. Louis, Peoria & Northern has placed an order with the Cooke Locomotive & Machine Works for two locomotives.

The Choctaw, Oklahoma & Gulf has placed an order with the Baldwin Locomotive Works for one consolidation engine.

The Texas & Pacific has placed an order with the Rogers Locomotive Co. for 10 locomotives. The details have not all been definitely settled.

The Illinois Central order will probably be for from 20 to 30 engines, 10 wheelers and switchers. No contract had been awarded at time of going to press.

The Schenectady Locomotive Works have received an order to build 10 mastodon compound engines with 23 and 35 x 32 in. cylinders, and seven 8-wheel passenger locomotives with 20 x 24 in. cylinders for the Southern Pacific.

The item in our last issue in reference to an order for two engines placed with the Richmond Locomotive Works by the Chicago & Northwestern was an error. We had in mind the two engines for the Chicago Great Western.

The Cleveland, Cincinnati, Chicago & St. Louis has placed an order with the Richmond Locomotive & Machine Works for two consolidation engines, one simple and one compound, similar to the sample locomotive built some time ago.

The Fremont, Elkhorn & Missouri Valley has placed an order for the 10 locomotives mentioned in our issue of last week with the Schenectady Locomotive Works. These engines are to be 10-wheel freight locomotives, similar to those ordered by the Chicago & Northwestern, although somewhat lighter in weight.

The Chicago & Northwestern has placed an order with the Schenectady Locomotive Works for 15 more Class R freight locomotives, making a total of 46 engines ordered since Jan. 1. Some of these engines are now being finished, and deliveries of those previously ordered, and noted in our issues of Jan. 22 and March 11, will be made gradually during the next two months.

The eight engines for the Pecos Valley & Northeastern (referred to in our last issue as Pecos Valley), the order for which has been given to the Brooks Locomotive Works, will be eight-wheel passenger engines and weigh 107,000 lbs. each, with 70,000 lbs. on the drivers. The principal dimensions are: Cylinders, 18 x 24 in.; driving wheels, 62 in. diameter; boiler, wagon top type, working steam pressure, 180 lbs.; firebox, length, 103 in., width, 33 in.; tender capacity, 4,000 gals. of water and 7½ tons of coal. They will have Westinghouse brakes, hammered iron and steel axles, Monarch Solid brakebeams, Ross-Meehan brake shoes on driving wheels, Jerome piston and valve rod packings, Detroit sight feed lubricators, French springs, Midvale tires and cast iron wheel centers.

It is reported that the Baldwin Locomotive Works have received orders for 77 locomotives for the Chinese Eastern Railroad (Manchurian Railroad.) All of these are of the Vauclain compound system. Fifty are consolidated locomotives weighing in working order about 70 gross tons, with cylinders 14 in. and 24 in. diameter, by 26 in. stroke, driving wheels 50 in. diameter; 8-wheel tenders; fuel wood or coal, but likely hereafter to be changed to inferior bituminous coal. Twenty-seven locomotives are 6-coupled tank engines, with 2-wheel rear trucks, cylinders 10 in. and 17 in. diameter, by 22 in. stroke, driving wheels 40½ in. diameter, weight in working order about 86,000 lbs.; fuel wood. Twelve tank engines are to be shipped in June, the remaining 65 in July, in time for all to arrive at destination before the close of navigation for this year. No confirmation of this report has been authorized by the Baldwin Locomotive Works, but we believe it to be entirely correct.

CAR BUILDING.

We are officially informed that the Wisconsin Central is not in the market for new cars.

Bids on the 1,000 new box cars for the Illinois Central, mentioned in our issue of May 20, were to be received by or before May 26, but contract has not been let as we go to press.

The Barney & Smith Car Co. are at work on an order of 500 freight cars for the Southern Pacific, given in January of this year. We referred to 100 of these cars in our issue of April 15.

In our issue of April 22 we referred to the Choctaw, Oklahoma & Gulf as contemplating buying some new freight equipment. It is now reported that contracts will be let within a short time for 200 or more cars.

It is reported that the Findlay, Fort Wayne & Western, Erie and Western New York & Pennsylvania roads contemplate buying new cars, but we were unable to confirm these statements at time of going to press.

The Cleveland, Cincinnati, Chicago & St. Louis has recently placed an order for 1,000 more box cars with Pullman's Palace Car Co. These cars are to be of 60,000 lbs. capacity, 36 ft. long inside, 8 ft. 3 in. wide in clear, 7 ft. 7¼ in. high in clear, and will weigh 32,000 lbs. They will be built of wood, with wood underframes, steel axles, iron bolsters, diamond trucks, cast iron brake shoes, Westinghouse air brakes, Janney couplers, Chicago grain doors, Dunham door fastenings, M. C. B. journal boxes and journal box lids, Chicago-Cleveland roofs, Detroit springs, and the railroad company's standard draft rigging will be used.

The Jackson & Sharp Co. of Wilmington, Del., has built four more sleeping cars for the Argentine Government railroads in addition to those mentioned in our issue of March 4. They are of 5 ft. 6 in. gage and 54 ft. long over corner posts, and 59 ft. 3 in. long over platforms. The width of bodies, outside, is 10 ft. 3 in. The underframes are entirely of steel, 10 in. channels being used, and the bodies rest on felt pads placed on top of the longitudinal channels. The framings of the bodies are teak, as is also the outside sheathing. The interior finish is quartered oak, relieved with black walnut. The roofs are arched, ventilation being obtained under the letter board and regulated by sliding ventilators worked from the inside. The cars have four double Pullman sections at one end, the rest of the space being occupied by five compartments, one for sleeping accommodations for four, and the others for two, persons. Electricity is used for lighting purposes, and is generated from the axle. The trucks are of pressed steel, English type, with half elliptic springs over the journals, and spiral bolster springs. The draw gear is also English, having a central continuous draw hook and side buffers running back to the bolsters.

BRIDGE BUILDING.

ADAMS, MASS.—Mr. John H. Emigh, Commissioner of Public Works, writes us that the State street bridge is not likely to be built this season. (Feb. 25, p. 146.)

ANOKA, MINN.—The Commissioners of Anoka County will build a bridge over Rum River at a cost of $6,500.

BAYONNE, N. J.—At a recent meeting of the Council the Central of N. J. asked permission to discontinue trains west of Eighth Street Station, that the company may build a modern steel bridge over Avenue C, between North and Seventh streets.

BLOOMSBURG, PA.—Boyd Trescott, Charles Noetling and Martin Houseknecht were appointed viewers to view site for a county bridge over the Susquehanna River in Center and Mifflin townships. C. H. Moore, Engineer; Charles M. Terwilliger, Clerk, Columbia County.

BOWLING GREEN, KY.—Press reports state that Warren County has sold bonds to the amount of $20,000 issued for building new bridges.

BRATTLEBORO, VT.—Press reports state that a bridge will be built across Whetstone Brook by the town at a cost not exceeding $15,000.

CANTON, O.—It is reported that the Commissioners of Stark County will advertise for new bids June 6, the former bids having been rejected, for the bridge to be built over the Mahoning River, in Alliance.

FORT WAYNE, IND.—It is stated that the Pennsylvania is considering, at the request of the Board of Public Works, the question of building a bridge over its tracks at Gay street.

KANSAS CITY, KAN.—The bill authorizing the Kansas City, Northwestern & Gulf, a new road, to build a bridge over the Missouri River at Quindaro, Kan., has passed the House at Washington. (March 25, p. 223.)

LAWRENCE, MASS.—A sub-committee has been appointed to consider plans for the Jackson St. bridge over Spicket River. This bridge has been talked of for several years and it is not known whether it will be of wood, iron or stone. Arthur D. Marble, City Engineer.

NEWNAN, GA.—The Commissioners of Coweta County, W. L. Stallings, Clerk, ask for bids until June 1 for building a bridge 234 ft. long, steel, or wood and steel, over White Oak Creek.

NEW YORK, N. Y.—Press reports state that Bridge Commissioner Shea, in accordance with authority granted by the Board of Public Improvements, intends to advertise for proposals for a new bridge over Newtown Creek, leading from Brooklyn to Newtown; estimated cost, $50,000.

PLYMOUTH, IND.—A committee of the City Council, it is stated, is considering the question of a new bridge over Yellow River, on East Garro St.

READING, PA.—Local press reports state that the residents of Amity Township have asked the Commissioners of Berks County to build a bridge 100 ft. long over the Manatawny at Weidner's mill. A. F. Mogel, Alfred F. Gunkle, County Clerks.

SHERMAN, TEX.—The Planters' Terminal Ry. Co. will need two bridges. (See Railroad Construction column.)

SIOUX CITY, IA.—The City Council has instructed the street committee to advertise for bids for a new steel bridge over Floyd River at Missouri St. (Dec. 31, '97, p. 934.)

The assistant city engineer is instructed by the Council to investigate and report as to the condition of the East Fourth St. bridge across the Floyd River.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Boston & Maine.—Common, quarterly, 1½ per cent., payable July 1.

Central Massachusetts.—Preferred ¾ per cent., payable June 1.

Chicago, Burlington & Quincy.—Quarterly, 1¼ per cent., payable June 15.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers.—Meets at the house of the society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month at 8 p. m.

American Society of Railroad Superintendents.—Annual meeting, Crossman House, Alexandria Bay, (Thousand Islands), N. Y., July 13 and 14.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7.30 p. m.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 7,137, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Thursday of each month, excepting July and August, at 7.30 p. m.

Engineers' Club of Columbus (O.).—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburg, Pa., on the third Tuesday in each month at 7.30 p. m.

Locomotive Foreman's Club.—Meets every second Tuesday in the clubroom of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Master Car Builders' Association.—Saratoga Springs, N. Y., Wednesday, June 15.

Master Mechanics' Association.—Saratoga Springs, N. Y., Monday, June 20.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7.30 p. m.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

Railway Club Secretaries.—Congress Hall, Saratoga, N. Y., June 8, 11 o'clock a. m. H. H. Roberts (St. Louis Railway Club), Secretary.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month at 8 p. m.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is secretary.

Western Railway Club.—Meets in Chicago on the Third Tuesday of each month at 2 p. m.

Western Society of Engineers.—Meets in its rooms on the first Wednesday of each month at 8 p. m., to hear reports and for the reading and discussion of papers. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago.

Train Dispatchers' Association.

The annual convention of the Train Dispatchers' Association of America will be held at Montreal, Que., June 8. Among the subjects to be discussed are Electric Train Order Signals Controlled by the Dispatcher, the Question of Absolute Meeting Points Between Trains of the Same Class, Electric Call Bells Under Control of the Dispatcher, Extras Passing Low Class Regular Trains Without Orders. A report will be presented by the Train Rules Committee. The President of the Association is H. B. Ware, Wymore, Neb., and the Secretary is J. F. Mackie, 5145 Prairie avenue, Chicago.

Car Service Managers.

The National Association of Car Service Managers held its annual meeting at Columbus, O., on May 17 and 18. The principal paper before the Association was one by Mr. C. O. Hunter, General Solicitor of the Columus, Hocking Valley & Toledo, on the "Legal Status of Demurrage." Papers were read by J. E. Challenger of Philadelphia on "Demurrage Before the Interstate Commerce Commission," and by W. M. Prall of St. Louis on the question of the amount of free time to be allowed on reconsigned freight.

The officers elected for the ensuing year are: President, Robert A. Taylor, Richmond, Va.; Vice-President, J. D. Barry, Columbus, O.; Secretary, A. E. Thomason, Scranton, Pa. The next convention will be held at Niagara Falls, N. Y., June 19, 1899.

Western Society of Engineers.

The quarters of the Western Society of Engineers in the Monadnock Building, Chicago, have recently been enlarged and improved, and the assembly room is now of such size as to accommodate the increased attendance at the meetings, and a separate room is provided for the library. An informal reception was held Saturday evening, May 21, at which 165 were present, including members, guests and a number of ladies. Mr. W. J. Karner, Assistant to the Chief Engineer of the Illinois Central Railroad, read a popular lecture on Cuba and the Philippine Islands, illustrated by the stereopticon.

The next regular meeting of the Western Society will be held June 1, at which time two papers will be read, one by Mr. G. A. M. Liljecranz, Assistant U. S. Engineer, entitled "Obstructive Bridges and Docks of the Chicago River;" the other by Mr. Samuel McElroy, Consulting Engineer, New York, on "Measuring Apparatus of the Kings County Survey."

National Electric Light Association.

A reception committee of twenty-five has been appointed to arrange for the reception and entertainment of the National Electric Light Association at the twenty-first convention to be held in Chicago June 7, 8 and 9. The convention will be as much of a business meeting as possible. The following is the list of papers already decided upon:

"Cost of Generation and Distribution of a Unit of Electricity." By Calvin W. Rice.

"General Distribution from Central Stations by Alternating Currents." Herbert A. Wagner.

"General Distribution from Central Stations by Direct Currents." Louis A. Ferguson.

"Public Lighting with Relation to Public Ownership or Control." Alex. Dow.

"Transformer Economy." Winder Elwell Goldsborough.

"Cost of Producing Electric Power by Water Power from Lachine Rapids, Canada." W. McLea Walbank.

Topics for Discussion.

"Legislative Policy as to Public Service Corporations."

"Prices and Discounts for Electric Current, and Methods of Charging Customers."

"Standardizing Apparatus for Central Station Use."

"Standardizing Specifications for Incandescent Lamps."

"Freight Rates on Electrical Apparatus."

A lecture on "Electricity Direct from Coal" will be given by Joseph Wetzler.

Engineers' Club of St. Louis.

The 473d meeting was held May 18, with President Bryan in the chair. Thirty-eight members and fourteen visitors were present.

Prof. J. H. Kinealy announced that the Entertainment Committee had arranged for an excursion to Granite City on Saturday afternoon, May 28.

The President announced that he had appointed as delegates to the Convention of the Civil Engineers of France, in Paris in June, Messrs. Charles Bouton, George W. Olshausen and A. H. Zeller.

Mr. M. L. Holman made an address upon "The Filtration of Water." He described the present practice in Germany in the filtration of water for the use of towns and cities. A description was given of the open sand filters in use in Hamburg, with the methods of operating and cleaning them. The German Government requires that water for city use shall contain less than 100 bacteria per cubic centimeter, and the water which passes through the filter is tested periodically to see that this requirement is carried out. The covered sand filters in use at Berlin and the artificial stone filters in use at Worms were also described. An interesting discussion followed, participated in by Messrs. Moore, Johnson, Herman, Ockerson, Sanger, Ferguson, Russell, Pitzman, Bryan, McMath, Colby and Dr. Glasgow.

Mr. E. J. Spencer then stated that a bill had passed both Houses of Congress and had been signed by the President authorizing the formation of a brigade of engineers, but that this number had been cut down arbitrarily by the Secretary of War to a single regiment, to be raised on the Eastern seaboard. He called attention to the usefulness of engineers in time of war, and suggested that the Engineers' Club of St. Louis take action in this matter by sending a telegram to the Secretary of War protesting against the cutting down of the brigade of engineers. Other members made remarks favoring this action. Prof. J. B. Johnson made a motion that the President appoint a committee of three to act on the lines suggested by Mr. Spencer. This motion was seconded, and, on being put to a vote, was unanimously carried. The President appointed as members of this committee Prof. J. B. Johnson, Lieut. E. J. Spencer and Mr. Julius Pitzman.

PERSONAL.

—Mr. R. M. Frazer, formerly General Freight Agent of the Baltimore & Ohio Southwestern, has been appointed Chairman of the St. Louis Traffic Association.

—Mr. David J. Jenkins, Chief Electrician of the Pennsylvania Steel Works, has been assigned as Assistant Engineer on the Amphitrite of Admiral Sampson's fleet, now in Cuban waters.

—Mr. J. T. Bootes, Assistant Engineer of the Cleveland & Pittsburgh, has been appointed Lieutenant of the junior grade in the U. S. N. Mr. Bootes was a cadet at the Naval Academy. He has been ordered to report at Boston for service.

—Mr. Nathan E. Baldwin, a Director of the New York & New Haven for five years until July, 1872, when that road was consolidated with the Hartford & New Haven, as the New York, New Haven & Hartford, died at his home in New Haven, Conn., May 20.

—Capt. William Murray Black, Corps of Engineers, U. S. A., M. Am. Soc. C. E., has been promoted to Major in the Corps, this promotion following the line of vacancies made by the death of Colonel King. First Lieutenant Matthews Patrick becomes Captain and Second Lieutenant George P. Howell First Lieutenant.

—Mr. James J. Travers, who in 1868 was Master Carbuilder of the Adirondack Railway, holding that position until the road was leased to the Delaware & Hudson Canal Co., died suddenly at his home in Saratoga Springs, N. Y., May 20, at the age of 82. He was also Carbuilder on the Rensselaer & Saratoga before taking service with the Adirondack Railway.

—Mr. Nettleton Neff, Assistant Engineer of the Western Division of the Pittsburgh, Ft. Wayne & Chicago (Pennsylvania Company), has resigned his position, his service having been accepted by the Government. He has been assigned to duty with the cavalry regiment organized by former Assistant Secretary of the Navy Theodore Roosevelt at San Antonio, Tex.

—Mr. Alexander Milloy, after 52 years' service with the Richelieu & Ontario Navigation Co., has resigned his position as General Traffic Manager, the resignation taking effect June 1. Mr. Milloy is 73 years old and had been with practically the same company since 1846, when he became booking clerk for the stage line, then running between Montreal and Toronto. This line eventually developed into the Richelieu & Ontario Navigation Co., which now operates a line of steamboats between Toronto and Montreal and points on the St. Lawrence River.

—Mr. Hiram H. Smith died at his home in Jackson, Mich., Sunday, May 15, at the age of 88. Mr. Smith was identified with the organization and was in charge of the building of the Jackson, Lansing & Saginaw in 1861. On its completion he was made Vice-President. The road was leased to the Michigan Central in 1871. Mr. Smith was also connected with the building of the Detroit, Lansing & Lake Michigan, now Detroit, Grand Rapids & Western, and the Detroit & Bay City, which is also now a part of the Michigan Central. He retired from active business in 1873.

—Mr. Ira G. Hedrick has just received from McGill University at Montreal, the *ad eundem gradum* degree of B. A. Sc. This gives him the privilege of taking the Ma. E. degree by examination at any time. The degree was conferred upon him in recognition of his services in giving to the engineering students of McGill a course of lectures in the actual designing of bridges, supplementary to Mr. Waddell's lectures on theory and practice. Mr. Hedrick took about two weeks to give the course, and covered the designing in detail of all kinds of bridges, from rolled I-beam spans up to very long spans, including both fixed and movable bridges.

—Lieut.-Colonel William R. King, Corps of Engineers, U. S. A., died at Rock Island, Ill., on the 18th inst. He was stationed at Rock Island as engineer officer in charge of the Mississippi River improvements from the mouth of the Missouri to St. Paul. Col. King was graduated from West Point in 1863, and went at once into the field as First Lieutenant of Engineers. He distinguished himself in the war, and was brevetted Major in April, 1865, for gallant conduct. He served usefully in the varied duties of the corps from the end of the war to the day of his death. Many members of the American Society of Civil Engineers remember him as a man of courtesy, geniality and unusual intelligence. He was stationed in and near New York from 1886 to 1895, having been in command of the engineer depot at Willetts Point.

—Major Charles W. Raymond, Corps of Engineers, U. S. A., M. Am. Soc. C. E., now stationed at Philadelphia, has been promoted to the rank of Lieutenant-Colonel, succeeding the late Lieut.-Col. W. R. King. Col. Raymond had been in charge of the river and harbor improvements on the Delaware River for several years, and of fortifications for the defense of Philadelphia. He was Engineer in charge of the work of deepening, from 23 to 26 ft., the channel between Camden and Philadelphia. He also superintended the building of the breakwater at Lewes, Del. Col. Raymond is a member of the Boards of Engineer Officers, to consider and report on the subject of harbor lines of the port of Philadelphia, the improvements of the port of Pensacola, Fla.; of the surveys and examinations of deep waterways and routes between the Great Lakes and the Atlantic, being President of the latter Board. In June, 1894, he was appointed a member of the Board to recommend what length of span would be safe and practical for a railroad bridge across the Hudson River between New York City and New Jersey.

ELECTIONS AND APPOINTMENTS.

American Express Co.—Francis F. Flagg, for many years connected with the company, and at present Assistant to the President, has been elected Third Vice-President, the office having been created for him.

Atchison, Topeka & Santa Fe.—W. G. Barnwell has been appointed General Agent of the Freight Department of both the Southern California and the Santa Fe Pacific, with office at Los Angeles, Cal.

Chicago Great Western.—In restoring the Division Superintendencies, R. W. Edwards has been appointed Superintendent of the Eastern Division, which extends from Chicago to Oelwein, Ia. The offices of Superintendents of the three divisions are now all filled. (April 29, p. 316.)

J. A. Kelly, the new Superintendent of the Western Division, has announced his first appointments. John Birse is appointed Trainmaster of his division and the auxiliary branches, with headquarters at St. Paul, succeeding George Gregory, transferred; J. R. Pheeney is appointed General Agent at St. Paul, succeeding L. C. Trow, resigned.

J. Burlingett, the new Superintendent of the Southwest Division, makes his first appointments as follows: Morris Dailey, Trainmaster on the Southwest Division, with jurisdiction east of South Des Moines; headquarters at Des Moines, Ia. Frank T. Slayton, Trainmaster, with jurisdiction west of South Des Moines; headquarters at Des Moines.

The appointments made by R. W. Edwards,

the Superintendent of the Eastern Division, make O. Cornelisen Chief Dispatcher of the Eastern Division, with headquarters at Dubuque, Ia., and George Gregory Trainmaster of the same division.

Erie.—Henry Adams, heretofore Division Freight Agent, has been appointed Acting Assistant General Freight Agent, relieving Robert M. Parker, who has left his position to accept military service. Mr. Parker was only recently appointed Assistant General Freight Agent. (May 13, p. 348.) Harry Wilson, Chief Clerk in the General Freight Agent's office, has been appointed Acting Division Freight Agent.

Fitchburg.—John Medway of Cambridge, Mass., Superintendent of Motive Power, with office in Boston, has resigned. He has been succeeded by J. W. Marden of Waltham, who is at present Superintendent of Car Service. Mr. Marden will have the two departments under his supervision.

Flint & Pere Marquette.—At the annual election held in Saginaw, Mich., May 18, Messrs. Oliver W. Mink of Boston, and James W. Ellsworth of New York, were elected Directors to succeed the late Henry V. Stone of Chicago, and Loum Snow of New Bedford, Mass., resigned.

Fort Worth & Rio Grande.—J. Van Rensselaer having resigned his office of Treasurer, Leonard O. Williams on May 21 was elected his successor, with office at Fort Worth, Texas.

Great Northern.—President James J. Hill announces that the vacancy caused by the resignation of W. H. Newman to accept the Presidency of the Lake Shore & Michigan Southern, will not be filled.

C. P. Smith has been appointed Resident Engineer on the Cascade Tunnel. Reference to the beginning of this work was noted in the Railroad Gazette, Aug. 27, 1897, p. 611.

J. M. Davis was recently appointed Assistant Superintendent of the St. Cloud & Fergus Falls Division, succeeding A. M. Smith, transferred. W. T. Tyler, heretofore Superintendent of the Terminal Division at Minneapolis, was appointed Superintendent of the Montana Division, succeeding J. G. Taylor, resigned. C. D. Harper, Northern Passenger Agent at Duluth, Minn., has been transferred to Helena, Mont. The transfer is to be made June 15.

W. L. Agnew has been appointed Advertising Agent of the G. N., succeeding Moses Folsom, who has been appointed Chief of the Immigration Department. Mr. Agnew has been connected with the St. Paul Trade Journal for several years, and was formerly teller in the Merchants' National Bank of St. Paul, Minn.

Lake Erie & Western.—J. C. Upp, for the past nine years Traveling Auditor on the main line, has been appointed Freight Agent at Lima, O.

Lake Shore & Michigan Southern.—President Newman announces the following changes due to the resignation of W. H. Canniff, General Manager, to accept the Presidency of the New York, Chicago & St. Louis (May 20, p. 365): The office of General Manager has been discontinued. P. S. Blodgett, in addition to his present duties as General Superintendent, will hereafter have charge of such matters as have heretofore been under the jurisdiction of the General Manager. P. P. Wright will remain in his office as Assistant General Manager and will continue to exercise the duties heretofore assigned him.

Mexican Central.—T. G. Mulhern has been appointed Superintendent of the Mexico Division, succeeding E. E. Styner, recently assigned to other duties. (May 13, p. 349.)

Minneapolis, St. Paul & Sault Ste. Marie.—John E. Shaughnessy has been appointed Purchasing Agent, with office at Minneapolis, Minn., succeeding T. A. Switz, resigned, to take service elsewhere. The resignation and appointment are effective June 1.

New York & Texas Steamship Co.—Charles Davies, for the past six years Agent in Florida for the N. Y. & T. SS. Co. (Mallory Line), and Assistant General Passenger Agent of the Brunswick & Florida Steamboat Co. (Cumberland Route), with office at Jacksonville, Fla., has resigned both of these positions.

New York Central & Hudson River.—William J. Wilgus, heretofore Chief Assistant Engineer, has been appointed Engineer of Maintenance of Way, and will hereafter have general supervision of the maintenance of track, bridges, buildings, platforms, docks and their appurtenances. Roadmasters and Master Builders will report to and receive their instructions from him. The office of Chief Assistant Engineer has been abolished.

Norfolk & Western.—H. H. Handy, Assistant Superintendent of Terminals, has been appointed Superintendent of the Norfolk Division, succeeding E. L. Du Barry, resigned, on account of ill health. A. W. Towsley has been appointed Car Service Agent, with office at Roanoke, Va., succeeding J. F. Snyder, transferred.

Northern Ry. N. B.—The Directors and officers of this company, formerly the Kent Northern, are as follows: Directors, Robert Hutchinson, James D. Phinney, Thomas Murray, William F. Brown, Lister Brown, Wilmot Brown of Richibucto, N. B., and William Gillispie of Moors Mills, N. B. Officers: William Brown, president, General Manager and Lessee, with office at Richibucto, and J. D. Phinney, Secretary.

Ogdensburg & Lake Champlain.—Theodore Butterfield, formerly General Passenger Agent of the Rome, Watertown & Ogdensburg, with office at Syracuse, N. Y., recently resigned (May 20, p. 366), has been appointed General Manager of the O. & L. C., which was recently sold to Charles R. Batt, representing Boston capitalists. (May 6, p. 334.) The other officials of the road are as follows: Frank Owen, Traffic Manager, with office at Ogdensburg; Charles G. Burnham, Treasurer, 15 Broad street, New York; Charles N. Chevalier, General Superintendent, Ogdensburg; and E. M. Harter, Auditor, with office at Ogdensburg.

Pittsburgh & Lake Erie.—At a special meeting of the Directors of this company, which is controlled by the Lake Shore & Michigan Southern, W. H. Newman, the new President of the L. S. & M. S., was unanimously chosen President. Mr. Callaway, the new President of the New York Central, was heretofore President of the P. & L. E.

Jesse Yohe, son of Superintendent Yohe, has been appointed Special Agent of coal traffic with headquarters at Cleveland, O.

Planters' Terminal.—The officers of this company, referred to in the Railroad Construction column, are: President, Burton R. Stare, Sherman, Tex.; Vice-President, L. Garver, Van Alstyne, Tex.; Secretary and Treasurer, W. O. Brackett, Sherman.

Queen & Crescent.—L. Sevier has been appointed General Freight Agent of the Alabama Great Southern at Birmingham, Ala., succeeding T. F. Steele, who has been appointed General Freight Agent of the New Orleans & Northeastern. (April 20, p. 366.) Mr. Sevier has heretofore been Soliciting Freight Agent of the A. C. S. at Birmingham. E. C. Runte has been appointed Ticket Agent of the N. O. & N. E. at New Orleans, La., succeeding Col. R. H. Garratt, deceased. (May 13, p. 347.)

Rio Grande Western.—New offices have recently been estatblished in the Owing's Building, 215 Dearborn street, Chicago, and E. Copeland has been appointed General Agent in charge. J. A. MacGregor has been appointed Traveling Freight Agent, and L. B. Eveland, heretofore Traveling Passenger Agent at Kansas City, Mo., has been transferred to Chicago, both with Mr. Copland. Mr. Copland informs us that this is an entirely new venture, and is for the purpose of bringing Utah before the Eastern public through the efforts of his road. Utah people can use his office as headquarters when visiting Chicago. A portion of the office is set aside for this purpose, and the Salt Lake City newspapers are kept on file.

St. Paul & Duluth.—E. Whitaker, heretofore Agent of the Minneapolis & St. Louis at St. Paul, has been appointed General Northern Passenger Agent of the St. P. & D., succeeding Frank Ross, resigned.

Titusville, Cambridge & Lake Erie.—At a meeting held May 18 the following Directors were elected: A. H. Steele, F. P. Brown, Robert L. Kernochan, James I. Bracht, Charles Burton, W. D. Kernochan, George A. Chase, of Titusville, N. Y., and Charles H. Treat, of New York. The Directors at a meeting held later elected A. H. Steele, 12 Broadway, New York, President; Charles Burton, Vice-President; George A. Chase, Secretary; Robert L. Kernochan, Treasurer, and F. P. Brown, General Manager. The general office is in Titusville.

Union Pacific.—At a meeting of the Directors, May 23, E. H. Harriman was elected Chairman of the Executive Committee. The other members of the committee are Winslow S. Pierce, Chairman of the Board of Directors and General Counsel; President Marvin Hughitt, of the Chicago & Northwestern; Otto H. Kuhn, of Kuhn, Loeb & Co., and James Stillman, President of the National City Bank.

Willard Massey, heretofore Traveling Passenger Agent in Boston, has been appointed New England Freight and Passenger Agent with headquarters in the Boston office, 5 State St. Mr. Massey has been with the U. P. for the past twelve years.

United New Jersey RR. & Canal Co. (P. RR.)—F. Wolcott Jackson, Vice-President, on May 18 was elected President to fill the vacancy caused by the death of Gen. Robert F. Stockton. (May 13, p. 347.) Mr. Jackson has been with the New Jersey RR. & Transportation Co. since 1855. That company was consolidated with the U. N. J. RR. & Canal Co. in January, 1867, he remaining with the new company. Alfred Van Santvoord, a stockholder for over fifty years, was elected Vice-President, succeeding Mr. Jackson. M. Taylor Pyne of Princeton, N. J., son-in-law of the late General Stockton, was elected a Director.

United States & Ontario Steam Navigation Co.—O. J. Hammon has been appointed General Freight Agent, succeeding W. K. Richards, and E. D. Comstock is appointed General Passenger Agent succeeding W. G. Sargeant. The headquarters of both are in the Carnegie Building, Pittsburg, Pa. The vessels of this company ply between Conneaut Harbor, O., and Port Dover, Ont., forming a connection between the Grand Trunk in Canada, and the Pittsburgh, Bessemer & Lake Erie in the United States.

West Virginia & Pittsburgh.—Hon. J. N. Camden, formerly President, and Clarence Carey, who were recently appointed Receivers (May 6, p. 332), announce the following appointments: A. H. Kunst, General Manager; M. W. Harrison, Treasurer, and Owen Kraft, to be Auditor, with offices at Weston, W. Va.

Wrightsville & Tennille.—E. K. Bryan, Jr., has been appointed General Freight and Passenger Agent, with office at Dublin, Ga., succeeding F. H. Roberson, resigned. The change was effective May 20.

RAILROAD CONSTRUCTION

Incorporations, Surveys, Etc.

ALASKA ROADS.—The Rufus E. Wood sailed from San Francisco, Cal., for Alaska May 20 with a party of 40 engineers and mechanics, who are sent, it is said, by a London and New York syndicate to survey a railroad route from Norton Sound to the nearest point on the Yukon.

Contracts have been let, according to report, for building a railroad from Skagway to Lake Bennett via the White Pass, and work will begin at once. This may be the Skagway & Lake Bennett Tramway Company's line, for which a bill was introduced by Senator McBride into the Senate last January.

ARIZONA & SOUTHEASTERN.—Surveys are made for the extension from Deer Point south 4 miles to the Mexican boundary line, and the branch is to be built within 90 days (May 6, p. 332.) The maximum grade is 1.5 p. c., and the maximum curves 7 degrees. No contracts have been let. (Official.)

ARKANSAS & OKLAHOMA.—Grading is begun on this line from Bentonville, Ark., to Gravett, 17 miles. The A. & O. was incorporated April 1 and is understood to be successor to the Bentonville Ry. (April 15, p. 285.) John M. Davis of Cassville, Mo., is among those interested.

ARKANSAS CENTRAL.—A mortgage for $8,700,000 has been filed at Little Rock, Ark., to secure bonds issued for building this new road from Fort Smith, Ark., east via Charleston to Paris, 44.5 miles, and thence eastward probably to Little Rock. (Feb. 25, p. 148.)

CALUMET WESTERN.—Right of way has been bought for $175,000 for this new belt line in the city limits of Chicago, to run from a point on the South Chicago & Southern line of the Pennsylvania Co., at Hegewisch, north between the Grand Calumet River and the Chicago & Western Indiana R. R. to 106th street, where connection is made with the Pittsburgh, Ft. Wayne & Chicago line of the P. Co. Right of way has been bought between the Calumet River and the C. & W. I. tracks, where warehouses, freight transfer buildings and a grain elevator of 1,000,000 bushels capacity will be erected. It is stated that the road is to be built and operated jointly by the P. Co., the Michigan Central and the Chicago, Rock Island & Pacific. The company was incorporated Sept. 2, 1897, with a capital stock of $200,000. (Sept. 17, 1897, p. 658.)

CANADIAN PACIFIC.—Bids were opened, according to report, on May 15 for the broad gage extension of the newly acquired Columbia & Western from Robson, B. C., west 100 miles to Midway. (Feb. 25, p. 148.)

Officials are inspecting the new short line between Ottawa and Montreal, and it is expected that the line will be open for traffic in July. The route is by way of the Montreal & Ottawa Ry., which was completed to Alfred, Ont., some years ago, and this line has been extended 39 miles to Ottawa. The distance between Montreal and Ottawa will be shortened some thirteen miles by the new line.

CANADIAN ROADS.—Premier Turner has introduced into the British Columbia Provincial Parliament a bill subsidizing a road for McKenzie & Mann to take the place of the Canadian Yukon Transportation line proposed by them, which bill was recently killed in the Dominion Senate. (April 8, p. 265.) The new line is to be an all-Canadian route. The agreement provides that it is to be built in two sections, the northern from the Stikine River to Lake Teslin; and the southern from the Stikine to an ocean port in British Columbia. Work is to begin on both sections in June, and the northern section is to be finished by Aug. 1, 1899. The southern section is to be finished within two and one-half years after the selection of an ocean port, which selection is to be made by the Governor-General-in-Council and the Lieutenant-Governor-In-Council. The agreement carries a subsidy of $4,000 a mile for both sections, but not to exceed the aggregate of $1,600,000. The road is to be assessed when completed at $2,000 per mile, and the Government is to receive 4 p. c. of the gross receipts. The company agrees to build immediately a wagon road along the northern section of the located line, which is to be free to the public during the building of the railroad.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has petitioned the Minneapolis, Minn., City Council for permission to lay two additional tracks through certain streets of that city to its freight yards.

CHICAGO, ROCK ISLAND & PACIFIC.—Tracklaying is begun on the Chicago, Rock Island & Texas extension from Bridgeport, Tex., west 28 miles to Jacksboro. (April 1, p. 245.)

CRIPPLE CREEK SHORT LINE.—Surveys are finished for this line from Colorado Springs, Col., west through Bear Creek Canyon, Seven Lakes and Dead Lake to Cripple Creek, 56 miles, and contracts are to be let in June. H. B. Stone of Colorado Springs is among those interested.

CROOKSTON TERMINAL.—This company, whose incorporation was noted last week (page 367), is to build a terminal system at Crookston, Minn. By the terms of the incorporation the line is to begin at a point within 25 miles of that city and to extend within the corporate limits, with side tracks, spurs and other necessary adjuncts. The incorporators and first Board of Directors are: William J. Law, Read Davies, John F. Irwin, Frank J. Kline and Raleigh E. Chinn, all of Minneapolis, Minn.

DENVER & RIO GRANDE.—Surveys are in progress near Leadville, Colo., according to report, for extensions to the Dolly B. and the Ibex mines.

DES ARC & NORTHERN.—Track-laying has been completed for 15.6 miles from Higginson to Hunterton on this line southeast from Higginson to Des Arc, Prairie Co., Ark., 19¾ miles. The Bayou Des Arc will be crossed with a pile trestle. E. R. Dalhoff, Magnolia, Kan., has the contract. George C. Griffith of Higginson, Ark., is President. (Sept. 3, 1897, p. 627.)

EL PASO & NORTHEASTERN.—Grading was begun May 16 on the Alamogordo & Sacramento Mountain extension from Alamogordo, N. M. (a point on the E. P. & N. E| now building), east 25 miles to the Sacramento Mountains. George S. Good & Co. of El Paso, Tex., have the contract. (April 22, p. 300.)

ERIE.—Preliminary work for raising the tracks at the Jersey City Terminal is under way. The old passenger train shed has been removed, and two additional tracks have been instalied. Concrete platforms have been laid and shelter sheds built. The work at the station will probably be finished by June 1, from which date the New York & Susquehanna trains are to use that terminal.

GILA VALLEY, GLOBE & NORTHERN.—Grading is reported completed from Geronimo, Ariz., to San Carlos on this new line from Geronimo northeast 69 miles to Globe. About two miles of track has been laid, and it is expected that trains will be running into San Carlos by July 1. William Garland, of Los Angeles, Cal., is President. (March 25, p. 224.)

GREAT NORTHERN.—A contract has been let to a Duluth firm for building a retaining wall on the Eastern Minnesota in connection with the superstructure for extending the company's viaduct approach to that city. Work is already begun.

A petition has been filed with the city of Seattle, Wash., asking for permission to build a wharf, dock and warehouse and necessary trackage to property recently acquired by the company at the foot of Harrison street.

GREAT NORTHERN (CAN.)—Locating surveys are being made, and bids will shortly be asked for the extension from Montcalm, Que., northeast via St. Nobert to Joliette. This company was incorporated in 1883 to build a line from Hawkesbury, Ont., a

point on the Canada Atlantic on the south side of the Ottawa River, northeast to Quebec, 226 miles. In 1894 the section from St. Jerome, Que., on the Canadian Pacific, northeast 28 miles to Montcalm, was completed, and two years later was built a 10-mile section from St. Tite, a point on the Quebec & Lake St. John, southwest to Ste. Flore. The proposed extension will nearly bridge the gap. The intention is to use the Q. & L. St. J. into Quebec.

Track laying is begun on the Fosston Branch beginning at Deer River, Minn. About 12 miles of track has been laid from Saunders. This line, when completed, will give a route from Fosston, Minn., east about 220 miles to Duluth. (Feb. 25, p. 148.)

GREAT NORTHWEST CENTRAL.—Surveys are under way, according to report, for an extension of this road west. The company was incorporated in 1886 to build a line from Brandon, Man., west via Rapid City to Battleford, 450 miles. The section from Chater on the Canadian Pacific northwest to Hamiota, 50.93 miles, was completed in 1890, and trains are operated from Chater into Brandon on the C. P. R.

ILLINOIS CENTRAL.—Work is begun on the Amboy Division, 275.48 miles, between Freeport and Centralia, Ill., in laying about 3,000 tons of new 75-lb. steel, replacing worn 56- and 60-lb. rail. About 19 miles of ballasting has been finished south from Pana. This work is in the nature of general repairs and improvements all arranged for and in progress. On the Memphis Division, 120.59 miles, between Fulton and Memphis, Tenn., all grades in excess of 26.4 ft. are to be reduced to that grade as a maximum. All of this work has been put under contract and is in progress. It is not expected that the whole will be finished this season. (April 8, p. 266.) Three thousand tons of steel is also to be laid on this division, replacing 56- and 61½-lb. rail. (Official.)

INTEROCEANIC OF MEXICO.—Surveys are in progress for a loop line from Cuantla, Mex., to Chitela, 65¾ km. (40.9 miles). Building may begin in October or November. The company is also considering changes in alignment, and new terminals are projected at Mexico City and Vera Cruz; also a new passenger station, warehouse and iron pier at Vera Cruz.

KANSAS & TEXAS COAL RY.—This company was incorporated in Missouri May 5, with a capital stock of $100,000, to build a standard gage line in Macon County, from Brevier, on the Chicago, Burlington & Quincy, to Ardmore. The incorporators are B. F. Hobart, George B. Leighton, W. P. Heath, E. B. Loveland and William Hall, all of St. Louis, Mo.

LITTLE KANAWHA.—Grading is in progress on an extension from Elizabeth, W. Va., east toward Burnsville, and track-laying has been finished to a point half a mile east of Palestine. The line from Elizabeth to Parkersburg, 26 miles, was finished in March. (March 11, p. 188.)

MISCELLANEOUS COMPANIES.—The Phoenix Construction & Supply Co., of New York, has been incorporated in New Jersey, with a capital stock of $6,000, to build railroads and highways. The directors are: John M. Sheehan, Frank P. Leddy and Cornelius Sheehan, all of New York City.

NEW YORK, WYOMING & WESTERN.—E. L. Jenks, according to report, is making surveys for this proposed line from Scranton, Pa., east to New York City. E. B. Sturgis of Scranton is President. (May 13, p. 348.)

NORTHERN PACIFIC.—Arrangements have been made between the N. P. and the Clarke Fork Coal Co. to build a branch in Carbon County, Mont., from Rockvale, south 10 miles up Clarke's Fork River to Gebo. The preliminary surveys were made last fall (Sept. 17, 1897, p. 659), and Engineer Gibson of St. Paul, Minn., is now cross-sectioning. The contract for building was to be let May 20. The line is to tap the Gebo coal mines, which are said to contain the only smelting coal in Montana. This coal will go to the Butte and Anaconda markets. Johnson & McCarthy, who operate a coal mine at Chestnut, Mont., are the leading spirits in the enterprise. E. L. Boardman, publisher of the Carbon County Sentinel at Gebo is among those interested.

PEMBROKE SOUTHERN.—J. S. Sherwood of Emsdale, Muskoka, Ont., has taken contract for 5 miles of the Golden Lake end of this line, which is projected to run from Golden Lake, Ont., on the Canada Atlantic, northeast 21 miles to Pembroke. Work is begun. William Russell, Jr., Pembroke, is Chief Engineer. **(Jan. 21, p. 50.)**

PENNSYLVANIA.—Work is begun on building of the spur tracks from the Delaware River Branch of the Kensington & Tacony RR. into the Franklin Arsenal. There will be 500 yards of track with sidings.

PLANTERS' TERMINAL.—The proposed route of this new line is from Sherman, Tex., a point on the Missouri, Kansas & Texas, south 16 miles via Howe to Van Alstyne. (April 8, p. 266.) It is not the intention to handle passengers except incidentally, the object of the enterprise being to provide competitive facilities to the grain merchants along the road and to transport cotton and other agricultural products. No surveys have yet been made, but the work will not be heavy, the country being rolling prairie. On the first eight miles a number of moderate fills and cuts must be made, but the last part is over exceptionally level country, where track will hardly need more than ditching. There will be needed two iron bridges of about 100 ft. each over creeks liable to sudden freshets. The enterprise remains at a standstill until the close of the war. (Official.) The officers are given under Elections and Appointments.

PORT JERVIS, MONTICELLO & NEW YORK.—Work is commenced on relaying seven miles of road on the Monticello Division with 65-lb. steel. The roadbed has recently been reballasted.

RED RIVER VALLEY.—This company has been incorporated in Kentucky with a capital stock of $25,000, to build a line from Rothwell, a point on an extension of the Baltimore & Ohio, southeast about 45 miles to a point near Salyersville. The incorporators are: James Muir, Florence N. Muir, Alfred French, Charles B. French, William Hubbard, Jr., Joseph W. McCausey.

ST. LOUIS, OKLAHOMA & SOUTHERN.—The House Committee on Indian Affairs has reported favorably on an amendment granting the right of way to this company through the Indian and Oklahoma Territories. The bill was originally passed about two years ago and authorizes the building from Claremore, I. T., a point on the St. Louis & San Francisco west and south to Stonewall, I. T., on the Red River and thence into Texas. The company had until March 28 to complete the survey of the entire line, to file maps with the Secretary of the Interior and to build the first 50 miles. The House Committee finds that at a cost of $9,000 survey has been made from Claremore to the Red River, 200 miles, and that maps and profiles are about ready to file. The committee recommends that the company be given until March 28, 1900, to build this 50 miles, and that it be authorized to build its branch line between Sasawka and Tishomingo instead of Sasawka and Okmulgee. It was stated in 1896 that the contract for building the road had been given to Callahan & Wogan of Omaha, Neb. (Dec. 1, 1896, p. 853.)

SAN FRANCISCO & SAN JOAQUIN VALLEY.—Rails were laid into Bakersfield, Cal., May 11, and it is expected that the line will be ready for freight and passenger traffic by May 27. Work is in progress on the extension from Stockton west to San Francisco. (April 22, p. 301.)

SANTA FE & GRAND CANYON.—The House Committee has reported favorably on a bill granting right of way to this company over a portion of the Grand Canyon forest reserve in Coconino County, northern Arizona. The line is projected to run from Williams, Ariz., on the Santa Fe Pacific, north via Flagstaff Junction to the rim of the Grand Canyon of the Colorado, 73 miles. Work was begun in February. W. M. O'Neill of Prescott is General Manager. (Feb. 25, p. 149.)

STOCKTON & TUOLUMNE.—Grading is in progress on this line from Stockton, Cal., east through Copperopolis and Sonora to Somersville, about 25 miles. Annie Kline Rikert, of San Francisco, is President. (April 1, p. 246.)

SOUTHERN INDIANA.—George Crocker, Chief Engineer of this company, which is the reorganized Evansville & Richmond, reports that there will be no extension of road made at present, but considerable betterment work will probably be done in the latter part of this year. Since Jan. 1 one mile of new siding has been built. Two spans of steel bridge 125 ft. long and the laying of three miles of new 70-lb. rail in addition to the three miles already laid since Jan. 1 is part of the work contemplated. Work on rebuilding the four miles of wooden bridges, which is now in progress, is expected to be finished by June 1.

SUGAR CREEK.—This company has been incorporated in West Virginia, with a capital stock of $250,000, to build a line from McDonald to Raleigh Court House. The incorporators are: J. W. Davis, George N. Davis, M. E. K. Davis of Coffman, W. Va., and E. H. Fudge and R. S. Fudge of Chicago, Ill.

TOLEDO & OTTAWA BEACH.—Work is being pushed rapidly on this line from Toledo, O., north to Trenton, Mich., 40 miles. At Trenton connection is made with the Detroit & Lima Northern, and it is understood that the T. & O. B. is to form part of that system and to complete the connection with the Columbus Northwestern now building in Ohio. The Ferguson Contracting Co. of New York has the contract for the T. & O. B., as well as for the other two roads. Joseph K. Duffy of Toledo is Vice-President of the T. & O. B. (April 29, p. 317.)

WAYCROSS AIR LINE.—Nearly all the grading is completed on the extension of this line from Nicholls, Ga., west 12 miles to Douglas. J. S. Bailey & Co., of McDonald's Mills, Ga., have recently bought the line. (April 15, p. 285.)

WINNIPEG & SOUTHEASTERN.—Grading is begun on this new line from Winnipeg, Man., southeast 80 miles to a point near Whitemouth Lake. Contracts have been let from Winnipeg to St. Anne des Chenes. (May 6, p. 333.)

WYOMING & BLACK HILLS.—The Crouch Construction Co. of Chicago has been given contract for building this line from Belle Fourche, S. D., on the Fremont, Elkorn & Missouri Valley line of the Chicago Southwestern, west 18 miles to Barrett, Wyo. Work is to begin June 1. This company was organized in 1894 as the Wyoming & Dakota, and several miles of the road were graded that year. George M. Nix, Dubuque, Ia., is President. H. S. Vincent, Deadwood, S. D., Chief Engineer. (July 13, 1894, p. 500.)

Electric Railroad Construction.

ALBANY, N. Y.—At a recent meeting of the directors of the Albany, Helderburg & Schoharie Electric Ry. Co., which was attended by Mr. H. W. Burgett, of Boston, it was decided to commence work at an early date, all legal claims against the company which have hindered the work having been withdrawn. This company was chartered Nov. 15, 1895, and a terminal in Albany secured.

BRIDGEPORT, CONN.—The Bridgeport Traction Co.'s Westport and Southport extension is finished and cars are expected to be running this week. The Western, or Washington Bridge, section of the Milford Electric Ry. will be opened May 30.

BROOKLYN, N. Y.—The new line of the Brooklyn Heights Railroad to Coney Island was formally opened for traffic May 20. Parlor cars of the Brooklyn Heights left the Manhattan end of the bridge at 10.30 o'clock a. m. and made the run to Coney Island, a distance of about 12 miles, in 57 minutes. The actual running time was 50 minutes, seven minutes having been lost through delays in the city. In our issue of Feb. 4, page 78, we described the road and showed a map of the new route. The dock property of the Bay Ridge terminal at the foot of Sixty-fifth St., Brooklyn, has been overhauled and will shortly be in condition to accommodate an anticipated heavy summer business. Arrangements are also being made with the Staten Island Rapid Transit Co. to operate the ferry line between the Battery, Manhattan and Sixty-fifth St., Brooklyn, and the question of reducing the rate, which has heretofore been 10 cents, is also being considered. The running time by this route would be but 40 minutes.

CANYON CITY, COL.—A new company has been formed to take up the franchises of the Canyon City & Cripple Creek Electric RR. The incorporators are Nelson F. Handy, George F. McRay, Hunter Palmer, Theodore Shomaker and Frank H. McGee, all of Canyon iCty.

DETROIT, MICH.—Press reports state that the Council of Wayne has granted a franchise to the Detroit, Plymouth & Northville Electric Ry. Co.

DOYLESTOWN, PA.—The Doylestown & Willow Grove Trolley Co., frequently mentioned in 1897, has completed its road and cars are running.

HAMILTON, ONT.—The Hamilton Radial Electric Ry. Co., it is stated, is in the market for material for building the Birch avenue extension. Stuart E. Malloch, Secretary; W. A. Wood, Treasurer.

LEWISTON, ME.—The Commercial & Financial Chronicle, New York, publishes an official statement of the Lewiston, Brunswick & Bath St. Ry. Co. "The company has bought the Brunswick & Topsham and has leased the Bath St. Ry. for 999 years, with option to buy. Control has been secured of the Lewiston & Auburn, and the title to the property will be taken as soon as the consolidated mortgage can be foreclosed. It will be acquired subject only to $85,000 of first mortgage bonds and about $10,000 of debts. The extensions contemplated and under way are from a connection with the Bath St. Ry. to a connection with the Brunswick road, and then through Brunswick and Topsham to the Lewiston & Auburn road, which will make an extension of about 26 miles. A large portion of this distance has been graded, and ties and rails will shortly be put down. It is also proposed to extend the road to Sabatters, 6 miles, and to Turner, 12 miles. The total length of road planned is 64.6 miles. The Lewiston, Brunswick & Bath has an authorized capital of $500,000 and proposes to make a mortgage for $1,000,000 to secure 5 per cent. gold bonds to mature in 1918." The officers are A. H. Shaw, President, Bath; I. C. Libby, Treasurer, Waterville, Me.; A. F. Gerald, Vice-President and General Manager, Fairfield, Me. It is expected to have cars running the entire length of the line by July 1. (Dec. 31, 1897, p. 936.)

MONTREAL, QUE.—The North Shore Electric Ry. was recently incorporated to build from Three Rivers to Montreal. Among the incorporators are: Hon. William Owens, Westmount; Hon. V. W. Larae, Quebec; William Strachan, R. Prefontaine, Thomas Gauthier and A. J. Corriveau, Montreal.

A bill is before the Parliament at Ottawa to authorize the Montreal & Southern Counties Ry. Co. to issue preferred stock for building an electric railroad from La Prairie to Montreal. (Jan. 28, p. 71.)

NEW YORK, N. Y.—The Metropolitan R. R. Co. and the Third Avenue R. R. Co. have made application to the Railroad Commissioners for permission to change the motive power on all their cable lines to the conduit electric system. The Metropolitan has also made application to change the motive power on its horse lines to conduit electric or to compressed air. Hearings will be given by the Commission on these applications Thursday, June 2, at the Fifth Avenue Hotel, New York City.

The Kings Bridge Ry. Co. has applied for franchises to build an electric road about eight miles long from the intersection of Manhattan avenue and the Boulevard, running along the latter thoroughfare to Kings Bridge road, from the junction of Amsterdam avenue and Kings Bridge road, connecting with the existing road, or Amsterdam avenue, at 162d street; thence along Kings Bridge road to and upon the Harlem ship-canal bridge, and over the proposed bridge across Spuyten Duyvil Creek to the northernmost point of intersection of West 230th street with the Kings Bridge road; thence along 230th street to and along Riverdale avenue to the city line. This road is to be a connection of the Third avenue line. (Jan. 28, p. 71.)

The Fort George & Eleventh Avenue RR. Co. has made formal application for a franchise to build a road 1,500 ft. long on Eleventh avenue, between Kings Bridge road and 175th street. (Feb. 4, p. 89.)

The North End St. RR. Co., with a capital of $5,000,000, asked authority to build a road thirteen miles long, withtermini at the intersection of Manhattan avenue and 116th street and at the intersection of Kings Bridge road and the northerly line of New York City, with numerous branches. This road is said to be backed by the Metropolitan St. Ry. Co.

PITTSBURGH, PA.—The Pittsburgh & Mansfield R. R. Co. has let the contract for building the bridge across the Monongahela River at Ferry street. The bridge will have three spans, 840, 155 and 790 ft. respectively. On the Pittsburgh side there will be a viaduct 1,100 ft. long, running to Fourth avenue, and on the other side three viaducts, 2,000, 1,000 and 300 ft. respectively. E. K. Morse is the Chief Engineer of the work, and M. L. Knight President and William Roseburg Secretary. Considerable work has been done on the suburban lines of the Pittsburgh & Mansfield in the town of Duquesne Heights, Knoxville, Mount Washington and Baltzbower. (June 5, 1896, p. 403; Jan. 29, 1897, p. 87.)

RIVERSIDE, CAL.—The City Board of Trustees of Riverside accepted the bid of the Riverside Electric Ry. Co., presented by Frank A. Miller, for an electric railroad franchise to cover certain streets of the city. The amount bid was 3 p. c. of the gross annual receipts of the road, after the first five years. A bond in the sum of $1,000, and signed by Frank A. Miller, Ed. E. Miller and George Frost, accompanied the bid.

ST. LOUIS, MO.—The St. Louis & Meramec River R. R. Co. has applied to the City Council for authority to lay tracks on Sarah St. and to double track a number of streets.

The St. Louis & Suburban Ry. Co. will extend its tracks north on Union Ave. and will double track some parts of its lines.

GENERAL RAILROAD NEWS.

Railroad Earnings.

Showing the gross and net earnings for the periods ending at the dates named:

December 31:		1897.	1896.	Inc. or Dec.	
Louisville, Evansville & St. Louis.					
12 months.....	Gross	$1,464,678	$1,502,194	D.	$37,516
12 "	Net	354,558	419,846	D.	65,288
February 28:					
Kansas City, Pittsburgh & Gulf.					
1 month.....	Gross	$264,088	$98,789	I.	$165,299
1 "	Net	75,029	25,753	I.	49,276
2 months.....	Gross	554,123	196,772	I.	357,351
2 "	Net	172,547	51,250	I.	121,297

March 31:		1898.	1897.	Inc. or Dec.	
Central Pacific.					
1 month	Gross	$1,598,678	$1,462,691	I.	$135,987
1 "	Net	496,880	427,137	I.	69,743
3 months	Gross	3,251,612	2,665,893	I.	585,719
3 "	Net	1,140,002	860,432	I.	279,570
Grand Trunk.					
1 month	Gross	$1,598,678	$1,462,691	I.	$135,987
1 "	Net	496,880	427,137	I.	69,743
Mobile & Ohio.					
1 month	Gross	$364,859	$323,122	I.	$41,737
1 "	Net	89,783	91,333	D.	1,550
9 months	Gross	3,224,492	2,967,975	I.	256,517
9 "	Net	1,135,795	1,093,453	I.	42,342

April 30:		1898.	1897.	Inc. or Dec.	
Chicago Great Western.					
1 month	Gross	$400,862	$370,588	I.	$30,274
1 "	Net	106,501	78,019	I.	28,482
4 months	Gross	1,676,185	1,509,693	I.	166,492
4 "	Net	469,227	396,296	I.	72,931
Northern Central.					
1 month	Gross	$481,002	$482,095	D.	$1,093
1 "	Net	92,854	122,650	D.	29,796
4 months	Gross	2,012,827	2,062,553	D.	49,726
4 "	Net	438,563	612,256	D.	173,693

ADDISON & PENNSYLVANIA.—The Buffalo & Susquehanna on May 20 took possession of the A. & P., which was recently sold under foreclosure suit of Randolph Rodman, Trustee for the first mortgage bondholders. (May 13, p. 349.)

BALITMORE & OHIO.—The Receivers will pay on June 1, at the Mercantile Trust Co., New York, interest on $5,000,000 receivers' certificates, issue of June 1, 1896, $150,000; on car certificates, interest $225; at the Maryland Trust Co., Baltimore, $932,000 Maryland Construction Co., certificates, interest $23,300; at the company's office in Philadelphia, on Schuylkill East Side RR. Co.'s first mortgage bonds, interest $112,550. May 6, p. 333.)

CATASAQUA & FOGELSVILLE (P. & R.).—Stockholders will hold a special meeting at the Reading Terminal, Philadelphia, June 22, to authorize the execution and delivery of new first mortgage bonds for $135,000. The old bonds for like amount were issued July 1, 1853, at 6 p. c., and ran to July 1, 1878, since which time they have been extended from time to time to July 1, 1898, at 5 p. c.

CATONSVILLE SHORT LINE.—This road has been sold to Nathaniel W. James of Catonsville, Md., for $20,000. A description of the road was given last week (p. 367).

CHICAGO, BURLINGTON & QUINCY.—First mortgage 7 p. c. bonds of the Tarkio Valley RR. to the value of $11,000 and of the Nodaway Valley RR. to the value of $10,000 have been drawn for payment at par June 1 at the office of the Trustees in Boston.

CHICAGO & OHIO RIVER.—By a settlement of the litigation over the Collett estate, the purchase of this road by the Peoria, Decatur & Evansville made in August, 1893, is declared void. The C. & O. R. runs from Olney, Ill., to Sidell, 85.42 miles.

CHICAGO & WEST MICHIGAN.—The Directors have agreed to pay coupons due June 1 on the 5 p. c. bonds, $20 in cash, and $5 in 10-year coupon scrip. (April 29, p. 318.)

CINCINNATI NORTHERN.—Press reports state that a certificate has been filed by President Calvin S. Brice for the increase of capital stock from $100,000 to $6,800,00. Of the increase $4,199.000 is to be preferred stock. The C. N. was incorporated last year to take over a portion of the property of the Cincinnati, Jackson & Mackinaw. The receiver of the old company was discharged in February. (Feb. 28, p. 150.)

COLUMBUS, SANDUSKY & HOCKING.—The Reorganization Committee, of which Louis Fitzgerald, New York, is Chairman, has announced a plan of reorganization as follows: The new company will issue first mortgage 4 p. c. gold bonds, $4,000,000, of which $3,000,000 will be issued at once and $1,000,000 reserved for additional property and for requirements; second mortgage 4 p. c. income bonds, $4,000,000; preferred 4 p. c. non-cumulative, $4,000,000; common stock, $4,000,000. The old securities are to be exchanged as follows: For each prior lien bond of $1,000 ($700,000 outstanding), a new first mortgage bond of $1,000 and new preferred stock $250; for each old general mortgage bond of $1,000 ($7,400,000 outstanding), new first mortgage bonds of $150, new second income bonds of $500, new preferred stock $250, with a cash assessment of $150; for each old income bond of $1,000 ($1,178,000 outstanding), new first mortgage bonds $100, new preferred stock $500, cash assessment $100; for each old share of stock ($4,041,000 preferred and $3,348,000 common, outstanding), new second mortgage income bond $5, new common stock $50, assessment $10. The assessments are to be called by the committee in installments of 25 p. c. upon ten days' notice, to be published after the plan is declared operative. Securities must be deposited with the Mercantile Trust Co., New York City, on or before June 30. (March 18, p. 209.)

COLUMBUS, HOCKING VALLEY & TOLEDO.—Judge Lurton of the United States Circuit Court at Columbus, O., on May 24, entered an order of sale of this road at a time not fixed. The upset price is $4,800,000. B. R. Cowen and A. H. Humes were appointed Special Masters for the sale. (May 6, p. 334.)

ELKHART & WESTERN.—The Lake Shore & Michigan Southern has bought all the stock and bonds of the E. & W. and is now in possession. This line extends from Elkhart, Ind., to Mishawake, 11.81 miles, and was opened in 1893. A map has recently been filed for an extension for 4 miles west from Mishawake to South Bend. (May 13, p. 348.) It has a capital stock of $300,000.

KINDERHOOK & HUDSON.—A petition has been filed with Judge Chester, of the Supreme Court, Special Term, in Albany, N. Y., by Rufus M. Townsend and others, to have the election which was held April 15 declared void. They maintain that the present Board of Directors was elected illegally and therefore cannot legally elect officers. The officers elected at the Directors' meeting, April 15, are as follows: Charles B. Haines, President; John Delahunty, Vice-President; H. McGonegal, Secretary, and William C. Roberts, Treasurer. (April 22, p. 299.)

MONTANA.—The Butte, Anaconda & Pacific took possession May 17, of the Montana Ry., known as the Stuart Branch of the Montana Union, which runs from Anaconda, Mont., east 9 miles to Stuart. (May 20, p. 368.)

NEW ENGLAND.—The stockholders, at a meeting on June 14, will vote on the question of leasing the line for 99 years from July 1 to the New York, New Haven & Hartford. (May 20, p. 368.)

NEW YORK, NEW HAVEN & HARTFORD.—The stockholders of this company on June 15 will vote to lease the property of the New England for 99 years, and the property of the Shepaug, Litchfield & Northern for 75 years, both from July 1. The N. E. stockholders vote on this question June 14 and the S., L. & N. June 3. (May 13, p. 350.)

NEW YORK, PHILADELPHIA & NORFOLK.—The Reorganization Committee announces that over two-thirds of the bondholders have assented to the plan of reorganization (April 22, p. 302), and it is considered that the foreclosure will take place Sept. 26, the date already announced.

OREGON IMPROVEMENT.—Holders of certificates representing the first mortgage bonds are notified that after June 1 they may exchange the same for first mortgage bonds of the Pacific Coast Co., which is successor to the old company, upon surrender to the Manhattan Trust Co., New York, or the Old Colony Trust Co., Boston, the coupon of the old bonds to be paid on that date. The Pacific Coast Co. took possession of the property at midnight, Nov. 30, 1897. It is capitalized as follows: First mortgage 5 p. c. 50-year gold bonds, $5,000,000; first preferred 5 p. c. stock, $1,525,000; second preferred 4 p. c. stock, $4,000,000; common stock, $7,000,000. Of the bonds, $4,446,000 is issued for reorganization and the remainder reserved for buying new steamship lines and other property at a rate not to exceed $100,000 per year. The property was sold at foreclosure to the Reorganization Committee Nov. 6, 1897. (Nov. 12, 1897, p. 807; March 18, p. 210.)

PECOS VALLEY & NORTHEASTERN.—This company, successor to the Pecos Valley Ry., is incorporated in New Mexico. That part of the line from Pecos City, Tex., to the State line is incorporated under the laws of Texas and is known as the Pecos River R. R. The Texas railroad law requires each railroad in Texas to have a separate organization outside of its affiliations. The new company took possession at midnight, April 30. (May 13, p. 350.)

SEACOAST.—This company has been incorporated in Pennsylvania with a capital stock of $1,200,000 as successor to the South Jersey. The incorporators are: Robert P. Linderman, South Bethlehem, Pa.; Francis I. Gowen and Logan M. Bullitt, Philadelphia; E. A. Jemus, Thompsonville, Pa.; Henry D. Moore, Haddenfield, N. J.; Robert H. McCarter, Newark, N. J. The new company will issue $600,000 common stock, $600,000 preferred, $350,000 prior lien bonds, $150,000 general mortgage A bonds and $600,000 general mortgage B bonds. The S. J. runs from Winslow Junction, N. J., to Cape May, 44.1 miles, with a branch from Tuckahoe to Sea Island, 12.1 miles. It was sold to the Reorganization Committee at public auction March 29. It has been leased to the Philadelphia & Reading, which company took possession April 9. (April 15, p. 286.)

TOLEDO, ST. LOUIS & KANSAS CITY.—Judge William H. Taft, at Toledo, O., on May 14 decided that the intervening creditors, on furnishing a bond for $40,000, may give notice of an appeal on the foreclosure decree. The matter is to be argued at the October term of the Court. (May 13, p. 350.)

UNION PACIFIC CENTRAL BRANCH.—The Central Branch of the U. P., formerly known as the Atchison & Pike's Peak, was sold at Atchison, Kas., May 23, to the bondholders. On the same day at Concordia, Kas., Special Master Hiram P. Dillon sold its leased line, the Atchison, Jewell County & Western, to the bondholders for $1,017,500. (May 13, p. 330.)

Electric Railroad News.

ANDERSON, IND.—It is stated that the Clodfelter Interurban Railway, which was being built from Marion to Anderson, was sold May 18 to the Marion City Railway and Union Traction Co. The Clodfelter Co. has been at work on its line for nearly five years, and, it is said, has expended $121,000. The new owners will have cars running from Marion to Anderson within a few months. (June 4, Oct. 15, 1897, pp. 405, 737.)

BALTIMORE, MD.—The sale of the property and franchises of the Columbia & Maryland Railway Co. to the Baltimore Security & Trading Co., March 25, 1898, was ratified by the court May 16, and the exceptions to the sale, filed by the Barney & Smith Car Co., were overruled. The Maryland Traction Co. was substituted by order of the court for the Baltimore Security & Trading Co. as purchasers. Permanent officers of the Maryland Traction Co. have not yet been elected. Concerning the plans for reorganization, the Baltimore "Sun" says:

Under the terms of the ordinance extending the time for the completion of the Edmondson Avenue, Catonsville & Ellicott City Railway the portion of the road on Franklin St. extended must be completed in 60 days and the road be in operation to Ellicott City in six months. This work will be done by the Maryland Traction Co., which was substituted as purchaser for the Baltimore end of the Boulevard line and all other Maryland franchises sold under foreclosure.

All the Maryland franchises except those connected with the Edmondson Avenue, Catonsville & Ellicott City Railway will be conveyed by the Maryland Traction Co. to the Eckington & Soldiers' Home Railway Co. of the District of Columbia. It is proposed to unite the Eckington & Soldiers' Home Railway, the Maryland & Washington Railway and the line running from the District of Columbia line through Hyattsville to Laurel, formerly belonging to the Columbia & Maryland Railway. The consolidated companies will be known as the City & Suburban Railway of the District of Columbia.

The Washington end will be completed to Berwyn and will be extended shortly to Laurel, Md. The portion of the District of Columbia will be rebuilt as a conduit electric. The companies to which the franchises have been conveyed are controlled by those interested in the company formed to purchase the entire property. (Apr. 1, p. 248.)

NEWARK, N. J.—The following officers were elected at the first meeting of North Jersey Street Ry. Co.: President, E. F. C. Young; Vice-President, David Young; Secretary, Wilbur F. Johnston; Treasurer, E. N. Hill, and Auditor, E. D. Hibbs. The Directors are E. F. C. Young, David Young, J. K. Corbiere, A. J. Cassatt, John W. Omberson, John F. Kehoe, William J. Davis, Dudley Farrand and Wilbur F. Johnston. J. K. Corbiere, the President of the original North Jersey Street Ry., resigned. The consolidation of the following corporations now form the North Jersey Street Ry.; Consolidated Traction, Jersey City & Bergen, Jersey City, Harrison & Kearny, Newark Passenger Railroad, New Jersey Traction, Passaic & Newark Electric, Passaic & Newark Electric Traction, Newark Plank Road, Port Richmond & Bergen Point Ferry, Bergen Point & Staten Island Ferry and Newark & South Orange.

RED BANK, N. J.—James E. Degnan was appointed receiver of the Atlantic Highlands, Red Bank & Long Branch Electric RR. May 23.

SEDALIA, MO.—The Sedalia Electric Ry., Light & Power Co., it is stated, disposed of its entire plant to an Eastern syndicate for $350,000. F. W. Child of New York has been appointed general manager, with headquarters at Sedalia. The company owns 15 miles of track, one park of 40 acres and another of 120 acres, while the lighting plant operates 160 arc and 2,000 incandescent lights. Extensive improvements are to be made at once.

TRAFFIC.

Traffic Notes.

The Western Car Service Association (Omaha) has decided to give five days' free time on carloads of coal, coke, ore, sand, salt, lime and fluxing materials.

Poole Brothers, of Chicago, ticket printers, have settled the suit of W. A. Thrall concerning the royalty on Thrall's patent mileage ticket, and will continue to print the mileage tickets of the Central Passenger Association as heretofore.

The St. Louis Coal Traffic Bureau has been reorganized. This association is composed of railroads carrying coal from mines in Illinois to East St. Louis. It was agreed that from Aug. 1 the rate from the inner group of mines should be 35 cents a ton.

Utah papers report that the Rio Grande Western has a contract for carrying large quantities of coal from Colorado to Ogden, to go to San Francisco for the United States Navy. It is expected that 50 cars a day will be sent for some time.

On Sunday, May 22, the Long Island Railroad carried about 50,000 visitors from Brooklyn, N. Y., to the military camp at Hempstead, 20 miles. In addition to the railroad traffic there was a continuous stream of visitors on bicycles for five or six hours in the early part of the day, and a similar stream homeward in the afternoon.

The Journal of Commerce (New York) reports that the railroads carrying grain from Buffalo to New York have agreed to establish a joint agency at New York to make grain rates for all the roads (these rates fluctuate considerably during the season of lake navigation), and that the different roads have agreed to accept the following proportions of the whole grain traffic:

	Per cent.
New York Central	40
Erie	25
Lehigh Valley	16
West Shore	15
Delaware, Lackawanna & Western	4
Total	100

Chicago Traffic Matters.

Chicago, May 25, 1898.

Western roads are in more trouble over passenger rates, the Southern Pacific having met the eastbound competition of the Canadian Pacific via Portland. When the war over Klondike rates began the Canadian Pacific made reduced rates from San Francisco and the Western lines met the competition; but, little business developing, the competition from 'Frisco was ignored. Now the Southern Pacific has finally concluded to fight the matter and put in a first-class rate to Chicago of $46.50, against the regular tariff of $62.50; and lower rates in all Western territory are likely.

On May 26 the new steamboat line of the Burke Transit Co. between Chicago and Waukegan and Kenosha began its service. The steamer T. S. Faxton will make daily trips.

The special committee appointed to consider the Klondike passenger rate dispute failed to make any headway.

A proposition to advance the rate on corn from Chicago to the seaboard has been voted down.

The Southwestern Traffic Association's new agreement provides that all rates be restored on June 1.

A reduction of 3 cents per 100 lbs. has been made in the rate on flour from Minneapolis and St. Paul to the Atlantic seaboard.

Eastbound shipments, exclusive of live stock, from Chicago and Chicago junctions to points at and beyond the Western termini of the Trunk lines for the week ending May 19 amounted to 129,468 tons, as compared with 129,653 tons the preceding week. This statement includes 71,638 tons of grain, 6,571 tons of flour and 18,481 tons of provisions. The following table shows the quantities and proportions carried by the respective roads:

	Week Ending May 19.		Week ending May 12.	
Roads.	Tons.	P. C.	Tons.	P. C.
Baltimore & Ohio	15,398	11.9	14,041	10.8
C., C., C. & St. L.	3,293	2.5	5,168	4.0
Erie	14,594	11.3	17,957	13.9
Grand Trunk	4,509	3.5	4,607	3.6
L. S. & M. S.	19,580	15.1	17,300	13.3
Michigan Central	17,308	13.4	15,311	11.8
N. Y. C. & St. L.	17,730	13.7	17,576	13.6
P. C., C. & St. L.	10,078	7.8	8,059	6.2
P., Ft. W. & C.	16,466	12.7	18,826	14.5
Wabash	10,512	8.1	10,808	8.3
Totals	129,468	100.0	129,653	100.0

Lake shipments last week were 130,847 tons.